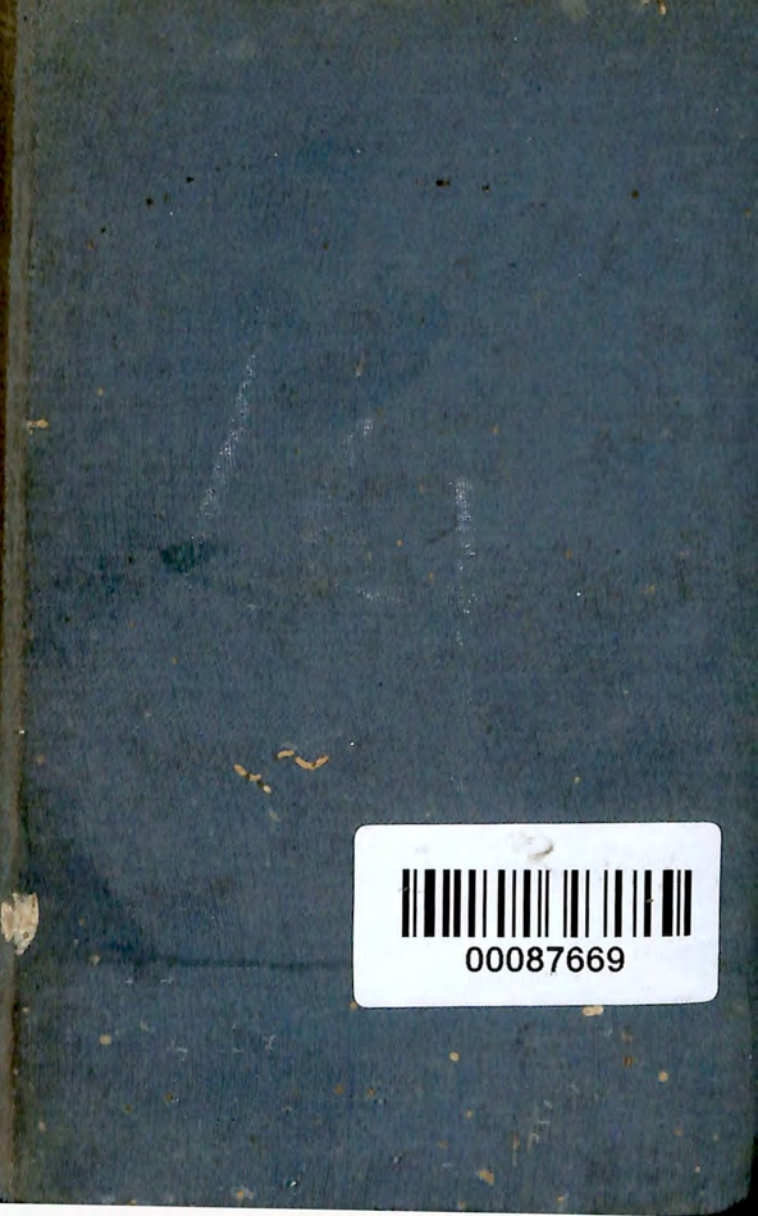
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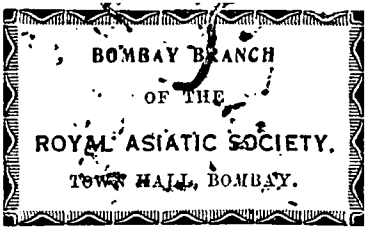

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EDITED BY

SIR WILLIAM JARDINE, BART.,
F.R.S.E., F.L.S., ETC., ETC.

VOL. XIV.

ORNITHOLOGY.

HUMMING BIRDS. PART 1st.

BY THE EDITOR.

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ac

EDINBURGH:
W. H. LIZARS, 3, ST. JAMES' SQUARE;
S. HIGHLEY, 32, FLEET STREET, LONDON; AND
W. CURRY, JUN. AND CO., DUBLIN.
1843.

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LINNÆUS

Ætatis 25

in his Lapland Dress

Car. Linnæus
Equ.

Engraved for the Naturalist's Library

THE

NATURALIST'S LIBRARY.

ORNITHOLOGY.

VOL. I.

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MEMOIR OF LINNÆUS.

ADVERTISEMENT.

THE extravagant price of standard works upon all departments of Natural Science, and the great difficulty of obtaining access to valuable foreign publications, have been a serious hinderance and discouragement to the studies of the Naturalist. There are also many sources of information upon his favourite subjects, which, not being altogether open, are apt to be overlooked by the student. Many eminent Naturalists have, in addition to their separate works, given to the world numerous excellent papers and treatises in various periodicals and transactions of societies:—Not a few have mixed up with the voluminous details of their Travels and Voyages, scientific facts and disquisitions of much importance, but not available unless by the purchase of expensive works; and, in addition, the labours of the older British Naturalists, still de-

servedly celebrated and universally quoted in our rudimentary books, are for the most part rarely to be met with, and are usually comprised in unwieldy folios.

It is with the view of obviating these difficulties, and of enabling all classes to procure information regarding the *Great Works of Creation*, at a moderate price, in a convenient shape, and in the most accurate manner, that the Proprietors of the *Naturalist's Library* have embarked in the undertaking. It will be their especial aim to make the history of the objects described, not only interesting and intelligible to the general reader, but of practical utility to the student and scientific Naturalist, by means of numerous plates carefully coloured, and scientific descriptions embracing the most interesting facts and anecdotes respecting the habits of the objects represented.

In the prosecution of their plan, they propose to illustrate the leading Zoological groups of the various branches; particularly such as are remarkable for their usefulness to man, or curious from the singularity of their structure or external beauty. And in order that purchasers may be enabled to avail themselves of the information conveyed regarding those classes of animals, to which their tastes and pursuits may peculiarly lead, each department of the work will be distinct by

itself, and will appear in consecutive volumes, accompanied with appropriate tables, indexes, and illustrations.

Arrangements have been made by which the use of all the standard British and Foreign publications necessary to the use of their design is effectually secured. The illustrations proposed to be given are so numerous, that it will be impossible always to procure them from the specimens themselves, and the greatest care, therefore, will be used in selecting, from the most approved sources, the plates which can be confidently relied on for accuracy, both of delineation and colouring. For the accomplishment of pretensions so high-sounding as these may appear to be, but more particularly as regards the low price at which volumes, containing so many coloured figures, have been promised, the proprietors beg to call the attention of the public to the fact, that the plates will be engraved, printed, and coloured by Mr Lizars, who, independent of his interest in the work, possesses every requisite necessary for conducting the illustrations with elegance and economy.

The Editorial department has been intrusted to Sir W. Jardine, and he will avail himself of the assistance of several of the most scientific Naturalists of

the present time, whose co-operation has been already promised and secured.

Having thus shortly detailed the outline of their plans, the Proprietors of the Naturalist's Library, with some degree of confidence, appeal to their first volume as an earnest of the style in which the work will be conducted; but while they do so, they are also determined to study every improvement which experience and circumstances may enable them to profit by, during the future progress of the Work.

The *second* volume of the Humming-Birds, which they expect will complete the natural history of this very beautiful and interesting group, is commenced, and will speedily appear; but, to give that variety which is essential towards keeping up the interest of such a work as a NATURALIST'S LIBRARY, a volume of Mammalia will be published before it. The subject of the second volume will be the NATURAL HISTORY OF MONKEYS, including numerous anecdotes of this curious race of animals, illustrated by upwards of thirty steel plates, coloured from nature, with numerous wood-cuts, and embellished with a Portrait and Life of Buffon, taken from the most authentic sources.

Many of our scientific friends have very properly put the question,—"How many volumes will the

Library contain?" But in this stage of our labours we are sorry that a specific answer can hardly be ventured. It appears, however, to us, that eight or ten volumes on each of the departments of Natural History, viz.—Mammalia, Ornithology, Ichthyology, and Entomology, will be about the limit; and when completed, they will constitute a very useful book of reference to the student, or more advanced Naturalist, at a price so moderate, and published at such intervals, as will render the book accessible to all readers.

While the Proprietors are unwilling to pledge themselves that the volumes shall follow each other at regularly stated intervals, they will take care to secure the convenience of the Trade, by issuing them at the same time with the Magazines and other Periodicals. Due intimation will also be given to the Public, by liberal advertisements, of each as it appears.

The subjects for the volumes which are now in preparation, are:—

NATURAL HISTORY OF MAN.

NATURAL HISTORY OF MONKEYS.

NATURAL HISTORY OF THE FELINE RACE, OR ANIMALS OF THE CAT KIND.

NATURAL HISTORY OF THE DOG.

NATURAL HISTORY OF SHEEP AND GOATS.

NATURAL HISTORY OF DEER.

NATURAL HISTORY OF EAGLES AND HAWKS.

NATURAL HISTORY OF CREEPERS.

NATURAL HISTORY OF GALLINACEOUS BIRDS.

NATURAL HISTORY OF PARTRIDGES AND GROUSE, OR THOSE BIRDS GENERALLY CALLED GAME.

NATURAL HISTORY OF CETACEA, OR WHALES.

NATURAL HISTORY OF THE SALMON.

NATURAL HISTORY OF COLEOPTEROUS INSECTS, OR BEETLES.

NATURAL HISTORY OF BEES, &c.

*** The scientific names only are engraved upon the plates, but the English names will always be found at the commencement of the letterpress descriptions; and this plan will be followed throughout the work.

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MEMOIR OF LINNÆUS.

In following out our intention mentioned in the Prospectus to the *Naturalist's Library*, of occasionally introducing portraits of illustrious naturalists, with sketches of their lives and writings, as far as the limits of the work would allow, we have commenced with the life of one who first practically pointed out the real utility of some system by which the great kingdoms of nature could be properly studied and understood; and their advantages to man most easily procured and adopted. The name of Linnæus is known to the whole civilized world; and, whether we consider the rank of his parents, the scanty means possessed by them to defray the expenses of his education, and what was necessary in the early part of his career to pursue his own favourite studies; or the limited state of the continental museums at that period, we shall think that the merit which his contemporaries awarded to him was very justly earned.

The principal facts introduced into the following sketch, are taken from the biography by Dr Pulteney, and the diary of Linnæus, written in Swedish by him-

self, or under his superintendence, and published as an appendix to the work above mentioned.

The diary is a curious and interesting document, and owes its preservation to Dr Maton; it was conveyed in the year 1779, with a variety of manuscripts, to be printed in England, by M. Fredenheim, son of Dr Mennander, Archbishop of Upsala, to Robert Gordon, Esq. merchant at Cadiz. In consequence of Mr Gordon's death, the publication of them was not accomplished, and they were disposed of to Dr Maton, who had the diary translated and printed in his edition of Dr Pulteney's Biography of Linnæus. The manuscript was written in a folio book containing about eighty pages, entitled "Vita Caroli Linnæi." The greater part of it is in the handwriting of his various pupils, of whom that of Dr Lindwall is most conspicuous, and it often runs from the first to third person, as if the different writers had not attended to what had been set down by their predecessor.

From this diary we learn that Nils Linnæus, the father of the naturalist, born in 1674, was the son of a peasant named Ingemar Bengtsson, in Smaland, and married Ingrid Ingemarsdotter, sister of Sven Tiliander,* pastor of Pietteryd. The latter took Nils Linnæus into his house, educated him along with his own

* Sven Tiliander, and the ancestors of the naturalist, took their surnames of Lindelius, Tiliander, and Linnæus, from a large linden or lime-tree, standing on the farm where he was born. This origin of surnames, taken from natural objects, is not uncommon in Sweden.

children, and having a good garden, he gave him also a taste for horticulture. After quitting school, he was sent to the university of Lund, where he had to contend with poverty, but nevertheless applied himself diligently to his studies. Retiring to his native place, he was admitted into holy orders by Bishop Cavallius, and first became curate, and afterwards comminster* of Stenbrohult. He soon after married the parson's eldest daughter, Christina Brodersonia, and succeeded to the charge of his father-in-law, which he enjoyed nearly forty years, discharging his duties with piety and moderation, and employing the greater part of his leisure in the cultivation of his garden.

Carl, the eldest son of Nils Linnæus, was born 24th May 1707, at Rashult, in the province of Smaland, while his father was still comminster. With an inheritance of his father's love for plants and their cultivation, he is thus recorded by one of his pupils: "From the very time that he first left his cradle, he almost lived in his father's garden, which was planted with some of the rarer shrubs and flowers; and thus were kindled, before he was well out of his mother's arms, those sparks which shone so vividly all his lifetime, and latterly burst into such a flame."

The elder Linnæus wished and intended that his first-born should succeed him in the office of pastor,

* Comminster, in the Swedish church establishment, is a clergyman somewhat similarly circumstanced to one who in Scotland serves a chapel of ease.

and he endeavoured to advance the clerical education of his son as far as his means would permit. At the age of seven, Linnæus was placed under the private charge of John Tiliander, and two years afterwards, was entered at the school of Wexio; but in both these places, the discipline is said to have been severe, and not well fitted for the advancement of a young man of his mild temper, and he was soon after placed under another private tutor, who possessed a more conciliating disposition. His distaste for ordinary studies could not be so easily overcome, and it was not till three years after that he received promotion to a higher *form* in the school, called the *circle*. In this rank he was allowed more leisure, which was invariably devoted to his favourite pursuits, and chiefly his earliest, that of plants.

According to the system of education at this time employed in Sweden, it was necessary that young men should pass from the schools, or from private teachers, to what was called the Gymnasium, where the higher branches of literature were taught; and at the age of sixteen, Linnæus was placed at this seminary. Here he still continued his dislike for those studies particularly necessary for a divine, and began to show a more decided taste for botany, by forming a small library of such books upon this science as he could procure, and from his studious perusal of them, he acquired the college name of the "Little Botanist."

Nearly two years after, the elder Linnæus came to Wexio to ascertain the progress of his son's studies,

and the disappointment of the sanguine hopes of a parent may be conceived, when the recommendations of his preceptors extended only to his ability for some manual employment, and that farther expense in forcing a learned education would be comparatively thrown away. The old clergyman, having for some time laboured under a complaint which might have now increased from his anxiety, was obliged to consult Dr Rothmán, a provincial physician ; and grieving at the seemingly wayward and careless disposition of his son, he opened his mind to the doctor, who kindly prescribed for both his mental and bodily sufferings. He remarked, that, although the boy might be unfit to follow that profession in which his father would have wished to have seen him his successor, there was the greater hope that some other study would be more ardently pursued, that he might yet arrive at eminence in medicine, as being more intimately connected with the branch of his own choosing ; and he offered to give young Linné board and instruction during the year which it was still necessary he should make up at the Gymnasium.

The offer of Dr Rothman was gratefully accepted, and that gentleman faithfully redeemed his promises. He gave his now willing pupil instructions in physiology and botany, pointing out the advantages of studying the latter science according to the system of Tournefort. In both Linnæus made considerable proficiency, had already commenced to arrange every plant in its

proper place, and even to doubt the situation of many whose characters had not been properly ascertained.

Next year it was thought necessary that Linnæus should complete his education at some university, and upon applying at the Gymnasium, he received the following metaphorical testimonial, which will show the little esteem in which his qualifications as a scholar were held, and is a curious example of the manner in which the professors worded their certificates. "Youth at school might be compared to shrubs in a garden, which will sometimes, though rarely, elude all the care of the gardener, but, if transplanted into a different soil, may become fruitful trees. With this view, therefore, and no other, the bearer was sent to the university, where it was possible that he might meet with a climate propitious to his progress."

With this certificate he proceeded to the university of Lund, and only procured admittance by the interest of his old preceptor Hök, who withheld the testimonial, and introduced him as his private pupil.

At Lund Linnæus lodged in the house of Dr Kilian Stobæus, professor of medicine, and physician to the king, a man of mild disposition, and excellent temper. Stobæus admired the industry of his lodger, and his acquirements in natural science; allowed him free access to his excellent library, his collections of shells, minerals, plants, and birds, and first pointed out to our young botanist the manner of making a *Hortus Siccus*, who, enthusiastic in all his undertakings, immediately commenced collecting, drying, and gluing upon paper,

the plants which grew in the vicinity. It was during one of these excursions with a brother botanist that he nearly lost his life from a bite of the *Furia infernalis;* the wounded part swelled and inflamed, and a fever ensued, from which he suffered long and severely.

The next summer's vacation was spent with his parents at Smaland; here he again met with Dr Rothman, who advised him to remove to Upsala, where he would derive greater advantages from the celebrated Professors Rudbeck and Roberg, than in the more limited university of Lund, and would also have access to a rich public library, and extensive botanic garden. Linnæus followed the advice of his former patron; but his parents were only able to allow him about eight pounds sterling, to defray all his expenses; and after a short time he found himself almost without the means of gaining a livelihood, uncertain where to obtain a meal, and obliged to patch his shoes with folded paper, instead of sending them to a shoemaker. He regretted his departure from a kind and hospitable roof, but did not possess the means of returning; and Dr Stobæus had taken it amiss, that he should have changed his residence without consulting him.

He was, however, soon relieved from this uncomfortable state by the kindness of new friends. The assiduity with which he studied the plants in the botanical garden, attracted the attention of Professor Rudbeck and Dr Celsius; and the latter requiring an assistant, thought Linnæus was qualified for the situation, and he opened his house and table to our natu-

ralist, who amply compensated this indulgence by his strict attention. It was here that he composed his *Spolia Botanica*, a work never published, and contracted a friendship with Artedi, afterwards celebrated for his Ichthyology. These two young men now devoted their whole leisure to natural history; Linnæus reserving for his share, birds, insects, and plants, while his companion took fishes, reptiles, &c.

About this period, Le Vaillant published his essay, "*Sur la Structure des Fleurs*;" the perusal of which raised in the mind of Linnæus the ideas of the importance of the stamina and pistils, and was the dawning of that system, hitherto uncontroverted, and on which his fame will continue based. The first sketch of this he drew in the form of a dissertation, "*De nuptiis Arborum*," and presented it to Dr Celsius, who again showed it to Professor Rudbeck. The latter was so pleased with the tract and its author, that he appointed him tutor to his children, and soon after having obtained permission, on account of his advanced age, to have an assistant in his duties, Linnæus was thought capable of teaching the science of botany, and was placed nearly at the head of an establishment, in which a year before he had applied for the situation of gardener.

He now lectured publicly, suggested alterations in the garden, endeavoured to introduce some arrangement, and began the valuable practice of giving botanical excursions to his students, noticing the plants which occurred in the vicinity of Upsala. He also

commenced the foundation of several of his works, the *Bibliotheca Botanica, Classes et Genera Plantarum.*

Thirty-six years before this time, Professor Rudbeck had been employed, by the command of Charles XI., to make the tour of Lapland, but the whole fruits of that expedition had been destroyed in the dreadful fire at Upsala in 1702. The Royal Academy again meditated the design of fitting out a second expedition, and the friends of Linnæus had sufficient interest to procure his appointment to the laborious undertaking of exploring Lapland. They could not have entrusted it to any one better qualified; and although agriculture and botany were the branches to which he was required principally to direct his attention, he omitted nothing which could improve his knowledge of the country, its productions, and inhabitants.

On account of the season, the journey could not be commenced before the spring, and Linnæus did not set out till the 13th May 1732. He commenced the journey in high spirits, and in love with nature; travelled on horseback, and carried his whole baggage on his back. It may be worth while to describe his dress and implements in his own words, from the narrative laid before the Academy of Sciences. "My clothes consisted of a light coat of West-Gothland linsey-woolsey cloth, without folds, lined with red shalloon, having small cuffs and collar of shag; leather breeches, a round wig, a green leather cap, and a pair of half boots. I carried a small leathern bag half an ell in length, but somewhat less in breadth, furnished on one

side with hooks and eyes, so that it could be opened and shut at pleasure. This bag contained one shirt, two pair of false sleeves, two half shirts, an inkstand, pencase, microscope, and spying-glass; a gauze cap to protect me occasionally from the gnats, a comb; my journal, and a parcel of paper stitched together for drawing plants, both in folio; my manuscript ornithology, *Flora Uplandica*, and *Characteres Generici*. I wore a hanger at my side, and carried a small fowlingpiece, as well as an octangular stick, graduated for the purpose of measuring. My pocketbook contained a passport from the governor of Upsala, and a recommendation from the Academy." During the rest of this excursion, he made use of the mode of travelling which was best suited to the roads and passes, and performed the greater part of it on foot. Many hardships were necessarily undergone from the climate and nature of the country. His life was often periled in crossing rapid rivers, upon the rude boats or rafts constructed by the inhabitants, and endangered in a dreary waste of almost boundless snow, where the tracts of the reindeer, and the degree of heat retained by their dung, were the only guides to the huts of their masters; and he was even once fired on by a native on the coast of Finmarck. Notwithstanding these difficulties, he has eulogized the country in the *Flora Lapponica*, as all that could be desired, happy and smiling, free from many diseases and the scourge of war, and possessing plentiful resources in itself; while the inhabitants are said to be innocent and primitive, displaying the great-

est hospitality and kindness to a stranger. In the journey, he travelled over the greater part of Lapland, skirting the boundaries of Norway, and returned to Upsala by the Gulf of Bothnia, having passed over an extent of above 4000 miles. He considered his labour amply remunerated by the information he had gained, and the discovery of new plants upon the higher mountains, with the payment of his expenses, amounting to about L.10.

Upon his return, he arranged all the plants according to his own yet embryo system, and delivered publicly an account of his journey, with a detailed description of the natural productions. This was the foundation of a work which he composed under the title of *Lachesis Lapponica*, and which remained unknown until after the purchase of his collections, by Sir J. E. Smith. By the exertions of that gentleman, it was translated, and published in two 8vo volumes; it is a work well worthy of perusal, and shows the industry and ardour which were exerted in the undertaking.

Previous to commencing his Lapland journey he had relinquished his botanical lectures, and on his return wished to give a course upon mineralogy, to the study of which he had lately applied himself. His financial concerns were also far from prosperous. The course was commenced, and many pupils obtained, but by the jealousy of other lecturers at his rising fame, it was put a stop to, upon the grounds that it required the qualification of Doctor of Medicine to lecture publicly.

He set out, therefore, to the great Swedish mining districts, to improve his knowledge in mineralogy, and the art of assaying; and at Fahlun was introduced to the Baron Reuterholm, Governor of Delarne, by whom he was employed to investigate the productions of the province. For this purpose he was accompanied by seven young men, whom he superintended; to each a distinct department was assigned, and a report was given in at the end of every day's journey, according to written rules which had been prepared before starting. The mountains of Dalecarlia were twice explored, and a part of Norway, and the materials collected formed the *Iter Dalecarlium*, a work which never seems to have been printed under the superintendence of its authors.

On his return, he was introduced to Dr Moreus, an eminent physician, and being often at his house, became deeply enamoured with his eldest daughter. Her father thought well of Linnæus, but not of his prospects in life: he wavered in giving his consent to the union—"voluit et noluit," expressively writes Linnæus to a friend—and ultimately decided that a probation of three years should be undergone, when his decision would be given. All the efforts of the naturalist were now turned to that of bettering his condition in life. Medicine was chosen as a profession, but for this a degree must be acquired, and he resolved to proceed to the university of Harderwick. He travelled by Hamburgh, through Holland, to the place of his destination; and at the former place, had nearly

got into disagreeable embarrassments, by pronouncing the famous Seven-Headed Hydra to be a deception, composed of weasels' jawbones, covered with serpents' skins. He found it necessary to leave the place, for in so great value was this serpent esteemed, that it had been pledged in security for a loan of ten thousand marks, a value which this discovery by no means enhanced. Upon his arrival at Harderwick, he was introduced to the professors, wrote and defended his thesis, and finally received his degree of M.D., with a diploma containing testimonials of his abilities, as flattering as those given upon his leaving school had been discouraging.

When this object was accomplished, it had been arranged, that Linnæus should settle in Sweden as a practical physician, under the patronage of Dr Moreus, and he set out on his return, travelling through Holland, that he might gain the acquaintance of the celebrated men, and increase his information in the profession he had now chosen. Various circumstances, however, prevented his immediate return, and the three probationary years had almost expired, before he could revisit his country or claim his bride.

At the commencement of his journey homewards, the first place where Linnæus remained for any time was Amsterdam. Here he gained the friendship of the celebrated Boerhaave, and that of Dr Gronovius; the latter a person of still greater importance to his after fame. Gronovius was so much pleased with the sketch of the *Systema Naturæ*, by our young

naturalist, that he requested to be allowed to defray the expense of the publication; and the request being granted, the work was immediately put to press in the commodious form of tables, embraced in about twelve folio pages, and in this way was the foundation laid of that system upon which almost all those of the present day are in many ways most intimately connected, and by which the arrangements of the older systematists were almost at once superseded.

By Dr Boerhaave, Linnæus was introduced to Mr Clifford, at this time the most enterprising botanist and horticulturist in Europe. With him Linnæus spent perhaps some of his happiest days. Devoted with all the ardour of a young man to a favourite and fascinating pursuit, he was at once placed in one of the most favourable situations in the world for following it out. "He enjoyed," says Dr Pulteney, pleasures and privileges scarcely at this time to be met with elsewhere in the world; access to a garden excellently stored with the finest exotics, and to a library furnished with almost every botanic author of note; permission to purchase whatever plants and books he thought worthy of being added to the collection; and leisure to prepare his own works for the press." * In addition to these advantages, it is said by his biographer Stœvers, that Clifford allowed him a salary of one thousand florins yearly, but which appears too munificent even for his liberal patron.

* Biography of Linnæus, p. 87.

So lavish, indeed, was Mr Clifford upon his favourite pursuit, that he proposed to send Linnæus to England to procure the botanical novelties, and to communicate with the most celebrated botanists and horticulturists. Linnæus could not resist the offer, and we find our enthusiastic naturalist sailing for Great Britain, instead of making his way to Sweden. On his arrival at London, he waited upon Sir Hans Sloane, to whom he had a letter from Boerhaave, which recommended him in the strongest language. But neither he nor Dillenius, whom he met at Oxford, showed such attention as might have been expected from these high testimonials. They looked upon him as a young innovator, who wished to overturn the old systems, only to exalt his own name upon a fleeting eminence. Dillenius spoke of him as the "young man who confounds all botany,"—treating him with reserve and haughtiness, until his discoveries were truly made known to him.

He visited also Martyn, Ward, Miller, Dr Shaw the celebrated traveller, Peter Collinson, &c.; and on his return to the continent, long continued a correspondence with these naturalists in the terms of the most sincere friendship; exchanged plants and other objects of natural history with them, and freely canvassed the different opinions set forth by each; and although these were not always unanimously decided, they appeared to have had no influence in disturbing the alliance previously formed.*

* Sir J. E. Smith's Letters.

He returned again to Holland, withstanding most pressing invitations to remain longer in Great Britain, deeply impressed with the importance of England as a country to forward the interests of natural science. London he calls "punctum saliens in vitello orbis;" and certainly, in this respect, its reputation has not decreased; it perhaps now possesses advantages superior to any city in the world for pursuing this study in all its branches.

During this excursion, Linnæus had greatly enriched the garden and herbarium* of his kind patron, with novelties from the English nurseries, and particularly with American plants, which Mr Clifford had long desired to possess. He now completed the arrangement of this fine collection, and undertook the superintendence of the *Hortus Cliffortianus*, a work bearing ample testimony to the liberality of Mr Clifford, and brought out in a style much superior in every respect to the productions of that period. The whole was arranged, written, and corrected, in nine months; and during that period, Linnæus even found time, or, as he termed it, recreation, to forward his *Critica Botanica*, *Genera Plantarum*, &c. This constant exertion and study appears, however, to have affected his health, and he became weak and reduced. Notwithstanding these symptoms, he was ultimately prevailed to remain for a few months longer in Holland, and arranged the botanic garden at Leyden for

* The *Cliffortian Hortus Siccus* is now in the Banksian library, and was purchased by Sir Joseph Banks for L.25.

Professor Von Royen; assisted Dr Gronovius with the *Flora Virginica*, and superintended the printing of the *Ichthyologia* of his deceased friend Artedi.

By the interest of his former patron, Dr Boerhaave, Linnæus was offered several situations abroad, all of which he was induced to refuse; he did not, however, on this account lose the doctor's esteem. The regard of this venerable man continued unimpaired, and Linnæus was one of the few friends whom he would allow to see him on his deathbed. Linnæus himself relates the last interview. He had bid him a sorrowful adieu, at the same time kissing his hand in token of respect; Boerhaave put Linnæus's hand to his lips in return, and addressed him in these impressive words, "I have lived my time, and my days are at an end. I have done every thing that was in my power. May God protect thee, with whom this duty remains! What the world required of me, it has got; but of thee, it expects much more. Farewell, my dear Linnæus!" On his return to his lodgings, Linnæus found, as a last and parting present, an elegant copy of his chemistry.

As Linnæus was about really to depart from Holland, where he had been so often detained, almost contrary to his intentions, he was seized with a violent ague, followed by cholera, and was saved from death with great exertions and difficulty. His final renovation may be said to be due to Mr Clifford, who, not forgetful of his strict friendship, removed his patient

again to Hartechamp, where he slowly recovered; and, though in a still weak state, set out for Sweden, taking his route by Paris, which he had long been anxious to behold. Introduced to the Jussieus, he received every attention, and was shown all that the stoves, and conservatories, and museums possessed, and made acquainted with the men of science. The Royal Academy of Sciences paid him a very high compliment. Having received permission to attend one of its sittings as a visiter, he was desired to wait a little while in the anteroom; and it was at length announced that the Academy had elected him a corresponding member.* He was importuned to remain in France, and indeed his merit everywhere produced the same consequences; but he expressed his firm determination to return to his own country.

From Paris, Linnæus went to Rouen, where he embarked for Sweden, after an absence of nearly three years; during this period, he had vastly increased his information, particularly upon botany, and had taken advantage of the Dutch presses, to publish many of his works, which he had either previously written or brought with him in an imperfect state, while the liberality of his patrons, and some learned societies, defrayed the expense, and even assisted to illustrate some of them with plates.

Upon his arrival in Sweden, Linnæus immediately visited his aged father, and thence proceeded to Stock-

* Thus related by Dr Pulteney.

holm, where he commenced practising as a physician, but met with much opposition, on account of his botanical studies. His perseverance, however, succeeded, and he obtained extensive practice. Writing to a friend, he says, "I am undeservedly got into so much practice, that from seven o'clock in the morning till eight in the evening, I have not even time to take a short dinner." He became acquainted with Captain Triewald, who was endeavouring to establish an Academy of Sciences; and in conjunction with this gentleman and the Baron Höpken, a society of some note was instituted, the presidency of which devolved upon himself. This was the origin of the present Academy of Stockholm. By the interest of one of its members, he was soon afterwards appointed physician to the navy; and with a fixed salary, he was chosen to give public lectures upon botany and mineralogy.

By these lucrative appointments, and the money he had saved during his residence in Holland, he was now in a situation of comparative independence, and was enabled formally to apply to Dr Moreus for the hand of his daughter; and no plea for rejection now existing, Linnæus was united to Sarah Elizabeth Morea, on the 26th of June 1739.

Our illustrious naturalist might now be said to have reached the height of his earthly happiness; independent in his circumstances—at peace, and beloved by his family, and looked up to and honoured by the heads of sciences in Europe. "He was not, however," says one of his biographers, "destined to

continue in the career of reputation and prosperity, without exciting envy, jealousy, and opposition, from various quarters, and the attacks of his adversaries did not fail to wound his ambition. Yet, remembering the advice of his venerable friend Boerhaave, and being of too high a cast of mind to entertain asperity, or indulge in splenetic invectives, he wisely resolved to abstain from controversy. He took another method to counteract the injurious influence of his opponents, and it would be well if all naturalists would act in the same dignified way when repelling ill-natured attacks. He thought that something was due to his countrymen, to show that all men of learning did not agree with his libellers, and he published a little work giving a brief sketch of his life, a list of his works, and the various testimonials given to his talents by the most eminent men of the day. The title was worthy of its author—*Orbis Eruditi Judicium de Caroli Linnæi, M.D., Scriptis.*" He made no comments, but allowed opinions to be formed from authority that could not be contradicted, and relied upon the judgment which would be given upon the words of a Boerhaave, a Dillenius, a Sauvauges, a Jussieu, and a Haller.

He was not, however, above being corrected, when done with a proper spirit; and was perfectly aware that in the vast range he had undertaken, perfection could not at once be obtained, and that some faults were almost inevitable. In a letter to Haller, he says, " who could perambulate, without erring, the wide-

spread domains of nature? Who could observe every thing with sufficient accuracy? Correct me in a friendly manner, and you shall have my best thanks. I have done all I could do. A great tree cannot bear a lofty top, when only it first begins to shoot off."

We have now seen Linnæus independent in his circumstances, and happy in his family, but there was still another step at which his ambition grasped: an ambition in this case laudable. It was the botanic chair of Upsala. He was eager to teach his favourite science in the halls where he had been himself taught, and had often entered with a boyish awe. It was still occupied by Rudbeck, now in the decline of life, and nearly unfit for the exertion of instructing a class. This celebrated man died in the ensuing year, and Linnæus offered himself as a candidate. Notwithstanding his fame, he was disappointed in this object. The University statutes opposed his success, and according to the regulations it was given to Dr Rosen, who had studied longer, and had greater claims upon Upsala. The summit of his wishes was, however, gained in the following year. He was appointed to the chair of medicine, vacant in the same University, and by a private arrangement with Dr Rosen effected an exchange, receiving the superintendence of the botanic garden, and charge of the whole department of Natural History.

Before his final removal to the professorship of Upsala, the Diet of the kingdom had resolved that expeditions should be undertaken into the least known

Swedish provinces, to inquire into their resources, and discover what substances could be usefully employed in their domestic manufactures. Linnæus was selected to perform the first journey, and having accepted the appointment, he set out for the Islands of Oeland and Gothland to endeavour to discover an earth fitted to make porcelain; this was the foundation of his *Iter Oelandicum*. He was accompanied by six naturalists, but was unsuccessful in the object of the excursion. The tour was nevertheless of great utility; he attended to mechanics, the arts, antiquities, manners of the people, fisheries, and general natural history. He discovered above one hundred plants which were not previously known to be indigenous, and first pointed out to the natives of those shores the use of *Arundo arenaria* to arrest the sand, and bind the soil upon the sea-beach.

At the age of thirty-four we find Linnæus enjoying the fruits of all his labours and perseverance, teaching his favourite science as its head in Sweden. He enjoyed himself to the utmost; he calls the garden "his Elysium," and the enthusiasm with which he set about improving it knew no bounds. At his appointment every thing was in a state of confusion: the dreadful fire which had converted the best part of Upsala to a heap of ruins in 1702, had extended its ravages also here, and at this period the garden did not contain more than fifty plants that were exotic. Linnæus applied to the Chancellor of the University, Count Charles Gyllenborg, who, fortunately, was a man of

considerable scientific acquirements, and a lover of botany, and he also thought that the fame of her University was of the utmost consequence to Upsala. Through the means of this gentleman, permission was obtained that the whole should be laid out anew. Plans were obtained from the King's architect, and stoves, a greenhouse, and a mansion for the professor, were soon finished. A gardener, whom Linnæus had formerly known with Mr Clifford, was also engaged, and by the assistance of the friends whom he had acquired during his short visits to London and Paris, the collection of plants was soon increased to above eleven hundred species, independent of those indigenous to Sweden. In a few years the garden at Upsala ranked equal, if not superior, to similar establishments in Europe.

Linnæus now continued an uninterrupted career, following out his duties as professor, and improving the garden. The number of students became increased nearly one thousand,* and the fame of the University extended over Europe, and even to America. He always made summer excursions at the head of his pupils, who frequently attended him to the amount of two hundred. They went in parties to explore different districts of the country; whenever some rare or remarkable plant, or some other natural curiosity, was discovered, a signal was given by a horn or trumpet,

* The usual number of students was 500; and in 1759, while Linnæus was rector, they amounted to 1500.

upon which the whole corps joined their chief to hear his demonstration and remarks. Linnæus was much impressed with the necessity of this mode of conveying instruction, and also of the utility of parties conducted in a similar way, to gain an intimate knowledge of the productions of any country. Their advantages have also been more lately shown, by the example being followed by the Professors of our Scotch Universities, and the valuable additions which of late years have been made to a Flora comparatively well explored. We trust that in another year the researches will have more varied objects.

There is another circumstance in the manner of teaching employed by Linnæus, too remarkable to be passed over, that of his rendering his pupils subservient to the distribution of his own system, and of studying natural history for the advancement of the science, and not merely as a branch of polite education. By his ready flow of language, and the happy manner in which he communicated his ideas, he rendered the students converts from any system they might have previously adopted, and made them as enthusiastic as himself; and when in distant lands, it was their pride to teach that system, and to defend it from the attacks of persons who thought it an impertinent innovation. In like manner did he imbue the minds of his pupils with a love for foreign travel and research in unknown countries, pointing out the delight of discovery in the most fascinating terms; and it was equally their pride to make known their discoveries, and transmit their

collections to a teacher whom they both loved and respected. In this he was also assisted by the government, who were most liberal in defraying the expense, and even sending out young men free to distant countries, which immensely increased the national collections. In a few years his pupils of the most persevering minds were distributed over the whole world, and their various histories would form of itself a volume of the most interesting kind. Of this enthusiasm for science Linnæus thus speaks, "If I look back upon the fate of naturalists, must I call madness or reason, that desire which allures us to seek and to examine plants? The irresistible attractions of nature can alone induce us to face so many dangers and troubles. No science has had so many martyrs as natural history." Many of his pupils were unfortunate, and fell victims to the elements, or to the diseases of a pestilential climate; but many returned, amply compensating themselves for the hardships they had undergone, while their names are handed down to science in tributes which were bestowed by their venerable preceptor.*

The fame and reputation of Linnæus had now gained him both riches and honours. He was admitted a member into most of the scientific societies of Europe. The Imperial Academy distinguished him by the name of Dioscorides Secundus. The Royal

* Osbeckia, Kalmia, Solandra, Alstroemeria, Loeflingia, &c., will recall the names of some of his pupils.

Academy of Sciences of Upsala, the Academy of Sciences at Montpelier, the Royal Academies of Berlin and Paris, and Royal Society of London, all ranked him among their members. In 1761, he attained an additional accession of honours, being presented by his Sovereign with letters of nobility. His name was changed to Von Linné, and arms were assumed corresponding with his new rank. But, perhaps, the most flattering testimony of the extent and magnitude, of his fame, was that which he received from the King of Spain, who invited him to settle at Madrid, with the offer of an annual pension for life of 2000 pistoles, letters of nobility, and the free exercise of his own religion. He returned his most grateful acknowledgments for the intended honour; and his answer, that "if he had any merits, they were due to his own country," shows the sense of obligation which he felt to the countrymen who had raised him to such an eminence.

The salaries which Linnæus received from his various public appointments, had placed him in affluent circumstances, and allowed him to gratify a wish which he had long indulged, the possession of a villa, where he could spend a part of his time, away from the hurry and bustle of a public life, and enjoy the quiet delights of a country retirement. He accordingly purchased the villa of Harmanby, about a league from Upsala, and during the last fifteen years of his life, mostly chose it for his summer residence. Here

he kept, comparatively speaking, a little university. His pupils followed him thither, and those who were foreigners used to rent lodgings in the villages of Honby and Edeby, which were both contiguous to his villa. At the distance of about a quarter of a league from his rural abode, he erected a little building upon an eminence which commanded a view of the surrounding country. In this he kept his collections of natural history, and delivered summer lectures in a familiar manner to his pupils and foreigners who came to reside at the above-mentioned villages. During these, the grave and solemn habit of a professor was laid aside, and that of a friendly companion, clothed in a dressing-gown, slippers, and a red fur cap, was assumed.

To the titles with which King Frederick Adolphus honoured our great naturalist, he added his private friendship, and Linnæus was often admitted to his company. Natural history was a favourite pursuit of this prince, and a collection built in the Castle of Ulrichsdale, about half a league from Stockholm, rapidly increased under the superintendence and arrangement of Linnæus, and furnished the materials for one of his most splendidly illustrated works entitled, "Museum Regis Adolphi Frederici." The Queen followed the tastes of her husband, and possessed a private collection also arranged by Linnæus. The leisure time in the summer vacations was often spent in these occupations, and the palaces of Ulrichs-

dale and Drottingholm, at easy distance from his own villa, were often the scene of his studies, and served as another recreation from the more severe duties of his professorship.

It was at this period of his life that he was seized with severe attacks of gout, which prevented his repose for many nights at a time, and which he relieved by eating wild strawberries; these were almost the first symptoms of an approaching decay in his vigorous constitution. The excitement of seeing a collection of novelties had a singular effect, and an anecdote is preserved, of his being cured in this way of a severe fit, by the return of a pupil from North America. He was afflicted with a violent fit of the gout, and was obliged to keep his bed almost totally deprived of the use of his limbs. When he heard of the return of Kalm, with a number of new plants and other curiosities, the desire of seeing these treasures, and the delight which he felt when he saw them, was so great as actually to make the gout disappear.

The family of Linnæus, consisting of only one son and four daughters, was now grown up. The son, his first-born, of whom so much was expected, inherited a portion of his father's abilities, but was not spared to bring them to that maturity, which a constant study for many years might have enabled him to reach. At the early age of ten, he is said to have been acquainted with most of the plants in the botanic garden, and the highest wishes of his father were, to

render him fit for, and to see him his successor in, the botanical chair. Let us see how these wishes were achieved.*

We have now brought down the principal incidents in the life of this great naturalist, to the time, when, though only fifty-six years of age, he felt the vigour of his constitution impaired, and his versatile mind commencing to wane. He was conscious that he had fulfilled his adopted motto, "Famam extendere factis," and was willing to relinquish his office before its duties became too severe for his declining health; and after academical services for a period of thirty years, Linnæus respectfully entreated his majesty, Gustavus, who had succeeded to the throne upon the demise of his parent, to accept his resignation. His request was declined with the most flattering objections, and

* Young Linnæus was born on the 20th January 1741, at Fahlun, the capital of Dalecarlia. At an early age he was placed under private tutors, and it was intended that he should study the science in which his father had gained so much reputation and honour. When only eighteen years of age, he was appointed demonstrator in the botanic garden at Upsala; three years after he became an author, and published descriptions of the rarer plants in the garden, and in the year following, was made assistant and successor to his father in the professorship. After his appointment, he travelled through France, England, Holland, and Germany, and his father's name everywhere procured him introductions. Upon his return to Upsala, he was taken ill of a bilious fever, which was succeeded by an apoplectic stroke, and terminated his life in the forty-second year of his age. With his death terminated also the male branch of the family of Linnæus.

the king refused to deprive Upsala of her chief splendour: but he increased the salary, and allowed the young Linnæus to be placed as assistant to the professorship, under the superintendence of his father. Thus did Linnæus see the fulfilment of his brightest hopes, in the appointment of his son, at the early age of twenty-two, to a chair, which would have been looked upon through Europe, as the greatest and most difficult to be represented.

Notwithstanding the relief which Linnæus experienced by the assistance of his son, he continued his public activity till two years before his death; a mind so constituted, and a manner of life so habituated to activity, could not at once relapse into idleness. In 1771, he is described by a traveller, as leading an active and bustling life, never seen at leisure, even his walks had for their objects discoveries in natural history; and all his moments not embittered by a painful disease, were devoted to his darling science. In the following year he gave a proof of the remaining vigour of his constitution, by delivering a customary oration upon his resignation of office of rector in the assembly, which he had already held three times. He chose as a subject the "Deliciæ Naturæ," and the whole academical forum found it so beautiful, that the students of the Swedish provinces sent deputies to him the next day, to entreat its translation into the language of that country.

In 1773, he was chosen member of a committee to superintend a better translation of the Bible into

Swedish, and the task of ascertaining and describing the plants and vegetable productions mentioned in the Holy Scriptures, was intrusted to his care. In the same year, we find him writing to Pennant in London, with all the enthusiasm of a young man entering upon a favourite study. "Long ago have I been informed, that my countryman, Dr Troil, has brought with him your presents, which I so eagerly expected. He arrived here the day before yesterday, and delivered your *Synopsis Quadrupedum* and your *Indian Zoology*. I return you my warmest thanks for each. I will peruse and reperuse your Synopsis a thousand times. I find much beauty and utility in it, and will study it thoroughly. After having read the work, I will ask you many questions, and never prove ungrateful to you; I will enter into no dispute about methods. I wish to God I could see your other works, especially that on birds; how much knowledge, which I am deprived of, might I collect from them! Farewell—you'll hear more from me next time."

In the year following, he composed his final essay. The king had received from Surinam a collection of curious plants preserved in spirits, with the fruit and flowers entire, and with much liberality presented them to Linnæus. Linnæus composed a catalogue of the whole, making out thirteen new genera, and about forty undescribed species. One of these he dedicated to his sovereign, under the title of Gustavia Augusta, as the truest way by which he could express his gratitude for the great distinctions conferred upon

himself. And it was in this same year that he received the first fatal warning that the termination of his earthly career was near at hand. While he gave a summer lecture in the botanical garden, he had an apoplectic stroke, and fell into a swoon, from which he did not for a long time recover. From this period he declined gradually, and he felt his own weakness. Pennant had written to him to fulfil his promise of writing the natural history of Lapland, but he answered, "that it would now be too late for him to begin." *

"Me quoque debilitat series immensa laborum,
Ante meum tempus cogor et esse Senex."

His activity and public duties continued unabated at intervals till 1776, two years before his death, when he suffered a second shock, which had an effect upon his speech, though he still retained a part of his wonted cheerfulness. He was carried to his museum, where he viewed with delight the treasures he had collected together from all parts of the world, and showed additional vigour upon seeing any new or rare production, which the attention of his friends still furnished to him. Towards the end of this year he suffered a third and fatal blow. His right side became completely dead. It was necessary to lead, support, dress, and feed him. His mental faculties

* Nunc nimis sero inceperim.

wasted with his body, and his earthly frame became to him a burden. In this distressing state he continued for nearly twelve months, at times suffering great agony from his previous disease; and as the powers of his constitution became exhausted, he became insensible to pain, and expired in a gentle slumber on the afternoon of the 10th January 1778, aged seventy years and seven months.

Thus terminated the active and ever-searching life of this pious and illustrious man, depriving natural history of her brightest ornament, and his country of a fellow-citizen and professor, whose loss could not be repaired throughout all Europe. Every human honour was paid to his remains, and the sorrow of his countrymen was without bounds. A general mourning was ordered at Upsala. To use the words of their sovereign, they had "*lost, alas! a man, whose celebrity was as great all over the world, as the honour was bright which his country derived from him as a citizen. Long will Upsala remember the celebrity which it acquired by the name of Linnœus!*"

In foreign lands equal regard was paid to his memory. He was eulogized in the Royal Academy by Condorcet and Vicq d'Azyr, and his bust was erected under the highest cedar in the Royal Gardens. Dr Hope, the Professor of Botany in the University of Edinburgh, had a monument to his name erected in the Botanic Garden. Many societies have been formed under the auspices of his name, of which the most important was

instituted in 1788, by the exertion of the late Sir James (then Dr) Edward Smith. This possesses the whole library, herbaria, and manuscripts, of the illustrious person whom it records.* They were purchased by the members at the demise of their respected founder and president, and they rightly judged that the Linnæan Society of London was the only place where these monuments of his labours and abilities could be with propriety deposited.

The person of Linnæus is thus described by his biographers. His stature was of middle size, but of considerable muscularity, his head large, with a strong gibbosity on the back part. This seems to have been remarked by himself and all his biographers, and must have been a very marked feature in the form of his cranium. His features were agreeable, and his countenance animated; his eyes remarkably bright, ardent, and piercing, of a brown colour; the hair brown, and towards the decline of life it became hoary. The inspection of his portraits, which are mostly painted at an advanced period of his life, give an idea of an open disposition, benignity and good-humour, and of a mind ardent and piercing. The best esteemed likeness at an advanced period, is a picture painted by a Swedish artist, belonging to the Royal Academy of Sciences at Stockholm, of which there is a copy in the Linnæan Society of London; but one of the most pleasing was

* Upon the death of the younger Linnæus, the collections and manuscripts of his father were offered for sale, and purchased by the late Sir J. E. Smith for L.1000.

painted by Hoffman, when Linnæus was a young man, superintending the garden of Mr Clifford. It represents him in a Lapland dress, and was engraved by a London artist in mezzotinto. It is almost the only likeness taken at an early period of his life, and it is therefore selected as our copy for embellishing the commencement of this volume.

From the sketch we have now endeavoured to give of the life of this naturalist, it will have been seen that his mind was ardent and enthusiastic in the highest degree, particularly in following out his beloved science; he never, however, in his enthusiasm, lost sight of the First Great Cause, but looked truly up to Nature's God, as the giver of all his benefits and acquirements. Over the door of his room was incribed, "Innocuè vivito—Numen adest." And when enumerating in his diary his various successes in life, he commences, "The Lord himself hath led him with his own Almighty hand;" and sums them up with "The Lord hath been with him whithersoever he hath walked, and hath cut off his enemies from before him, and hath made him a name like the name of the great men that are in the earth." The most important of his works commence and finish with some verse from the Scriptures, implying the power or greatness of God, or his own gratitude to Providence for the innumerable benefits conferred upon himself and the inhabitants of the world; and his descriptions are continually interspersed with expressions of admiration, of gratitude, and love.

His memory was most comprehensive, and remained almost unimpaired till his sixtieth year; but the most remarkable feature in his comprehensive mind, was the power to seize upon the essential characters of whatever he was engaged with, to separate the useful from the useless, and at once to characterise them with that decision and clearness which so peculiarly mark his writings and descriptions. A better example of this cannot be referred to, and his style will be better understood in the perusal, than his *Imperium Naturæ*, or the preface to the three kingdoms of his *Systema Naturæ*."

This love of order was equally conspicuous in his domestic arrangements. In winter he slept from nine to six, in summer from ten to three; but he never extended his application of mind beyond the moment at which he felt fatigue, and whatever fact came to his knowledge, he noted it immediately in its proper place. He was frugal in his way of living, and in his greatest prosperity never gave way to extravagance or ostentation; he was a strict economist, yet liberal in conferring benefits. He often relieved his pupils when in want, and was always ready to assist them in their travels, either by money or advice. In his capacity as teacher, he possessed the faculty of interesting his hearers, and of making himself easily understood, and his pupils looked upon him more in the light of a counsellor or beloved adviser, than as a grave or austere professor.

The character of this great Naturalist is easily defined from the nature of his habits and pursuits. He was fond of renown, and loved applause; but what man was ever insensible to panegyric, or could hear with indifference the voice of universal admiration at his own genius. Study was his ruling passion; and he had but one desire,—that of enlightening mankind. He was one of those whose penetrating mind soared above the attainments of his contemporaries, and saw farther than the limited horizon of the age in which he lived.

There are some men whose appearance is the date of a new era, whose talents overcome the poverty of their birth, and every impediment that obstructs their path. If they seek glory in arms, in letters, or in science, they find it; because Nature has endowed them with a sagacity of comprehension and a determination of will which carries them through all obstacles, and crowns their efforts with success. Such a man was Linnæus: he was born a Naturalist, just as Newton was born an astronomer, Milton a poet, or Napoleon a soldier.

Although the soil of Sweden is not rich either in plants or insects, and many of its feathered tribes are but temporary visitants, leaving it at stated periods in quest of milder climes, nevertheless it was amidst this physical barrenness that the taste of Linnæus for his favourite pursuit broke out almost from his earliest infancy, and found the means not

only of its gratification, but of laying the basis of a system which soon spread its dominion over the whole world of science. Almost within the Arctic Circle, this enthusiast of nature felt all those inspirations which are generally supposed to be the peculiar offspring of warmer regions.

It is perhaps worthy of incidental remark, that the most part of naturalists have commenced their career with the study of botany; and this admits of an obvious explanation. The animals look upon man as their enemy, and fly his approach; the mineral kingdom is concealed in the bowels of the earth, and cannot be reached except by tedious and painful exertions. On the other hand, plants and vegetables seem to covet the admiration and court the acquaintance of man: they unfold spontaneously their smiling beauties to his eye, and thus, as it were, invite him to examine and explain their structure. This branch of natural science is not merely the most easy and attractive at the outset; it is the key of all the rest. Whoever becomes familiar with plants and herbs, soon desires to know the names of the insects that feed or lodge among their leaves; he then wishes to extend his observation to the nature of the soil that nourishes them, and thus, by an obvious transition, he passes from botany to the study of zoology and mineralogy.

This was exactly the case with Linnæus; he was a botanist from his cradle; he lived from his childhood amidst shrubs and flowers; and, in comme-

moration of his peculiar tastes even at that age, a corner of his father's garden bore the name of Charles*. It was this love for his favourite occupation, the resistless attraction of fields and meadows, that must account for the slowness of his progress at school, and also for the charge of incapacity brought against him by one of his teachers, Lanarius (whose name Cuvier has taken care to preserve), who would have extinguished this meteor of natural science, by counselling his father to bind him an apprentice to some obscure profession, —a shoemaker, or, according to others, a tailor, or a carpenter,—from a belief that Providence had not endowed him with sufficient aptitude for a liberal education.

The struggles and hardships he was doomed to encounter in his youth, had no effect in damping his ardour or slackening his application. It often happens that poverty, instead of disheartening or overwhelming genius, only developes and fortifies it the more; and when we read of the future Pliny of the North receiving at college the alms of the charitable, wearing the cast-off clothes of his com-

* It is recorded of the mother of Linnæus, that when she perceived the bent of his mind so contrary to the studies for the church, to which he was originally destined, she expressly forbade her other son, Samuel, from ever entering his father's garden, being persuaded that he would there contract those tastes and habits that had defeated her fond hopes of making Charles a clergyman.

rades, or obliged to patch with bark or coarse paper those shoes which he had solicited from some of his companions, we are reminded of many similar examples in our own country:—of the orientalist, Murray, who learned his alphabet from letters rudely drawn with a burnt heather twig on the back of a wool card—of Leyden, who read the book he had borrowed by the borrowed light of a blacksmith's forge; and of Adams, who attended the College of Edinburgh when he was often too poor to purchase a dinner, and used to consume his penny roll during a solitary walk round the Meadows, or, if the day was wet, in climbing the high flights of common stairs that led from the Parliament Square to the Cowgate. Of these scholastic miseries Linnæus had his share; but they abated nothing from the ardour of his studies, and in the pages of Tournefort he found consolation for all the difficulties and discouragements he experienced in the gymnasium of Wexio.

His reputation was European, long before fortune deigned to smile on his labours. Often he used to apply to himself, as a motto, the words of the Latin poet, *Laudatur et alget*, "He is praised, and starves." But, in spite of his necessities, the consciousness of his intellectual superiority inspired him with all the pride of independence; while the charities conferred upon him, instead of lessening his dignity, reflected honour both on him who received and on those who bestowed them. It was the wants of

his academical life that made him kind towards his own students, many of whom he aided both with his counsels and his money.

His sense of gratitude was strong; and in his generous heart every sentiment of benevolence found a place. An injury he could forget, but never a benefit. His friendship for Rosen, who accommodated him with the botanical chair, was as sincere as it was lasting. His early patron, Clifford, has been immortalized by the grateful pen of his illustrious protegé, who delighted to inscribe the name of his Macænas in several of those great works which will remain a monument to both for many ages yet to come. It was this feeling of respect that induced him to decline the pressing offer of Van Royen to take charge of the botanical gardens at Leyden, where he might have enjoyed a secure and comfortable livelihood. The terms proposed, of classifying the plants according to the method of Boerhaave, contrary to the arrangement adopted in the *Hortus Cliffortianus*, was the cause of his declining to accept this permanent situation; and thus, although dependent at the time on the bounty of others, he hesitated not to sacrifice the tempting prospect of a quiet and happy independence, to what he believed due to the memory of his benefactor.

His writings and correspondence abound with similar proofs of the warmth of his attachments. He mentions, in the most affectionate terms, the

premature death of Hasselquist, who was cut off at Smyrna in 1752, and of Loefling, who died in America in 1756. His grief for Artedi showed how ardent had been the friendship of their youth: this Naturalist had been his college companion; they had studied together at Upsala, and from the similarity of their pursuits, had been led to contract for each other the tenderest personal esteem. After the death of his friend, Linnæus, to whom he had bequeathed the charge of his manuscripts, published his work on Ichthyology; and in a preface, which has been applauded as a model of beautiful latinity, he deplored the fate of his class-fellow in language that reminds us of the pathetic lamentations of David over his beloved Jonathan.

In nothing was the benevolence and good nature of this illustrious man more remarkably displayed, than in his conduct towards those who vilified and opposed him, as the author of a new system subversive of all established arrangements. He met with many detractors in France. His principal adversaries were Adanson, Buffon, and Lamethrie; the latter bitterly ridiculed him for placing man among the mammiferous animals—in the same class with the horse and the hog! Buffon affected to deny that he had either method or system. The learned Haller was the most formidable among his German antagonists. "Linnæus (says he) sets himself up as another Adam, to give names to the whole animal creation according to certain marks of his own,

without the least regard to his predecessors. He almost dares to place a man and a monkey in the same category." Zimmerman, too, complained that the Swedish Naturalist, in a few years, had entirely demolished botany, and raised his own fantastic theories on the ruins of every other.

The only vengeance Linnæus resorted to in retaliating upon his enemies, was either to treat their attacks with silent indifference, or to reply in pithy epigrams, which might expose the malice without tarnishing the memory of his critics. Sometimes he would affix their names to prickly shrubs, or stinging plants, or obscure flowers; but rarely deigned to make any public vindication of himself. His usual remark was, "I mean to employ the years that Providence allots me in making useful observations, and not in answering the cavils of my opponents. The errors of Natural History cannot be defended; its truths cannot be concealed. It remains for posterity to judge, and to that tribunal I appeal."

Some of his revilers lived to retract their calumnies, and withdraw their opposition to his system. The son of Haller addressed to him letters of apology, expressing regret at having written against him. Siegesbeck, the most fiery of his antagonists, also testified his sincere repentance for having assailed his reputation, and implored him to forget the wrongs which he might have sustained at his hands. He even reckoned so far on the generosity

of Linnæus, as to solicit from him the office of conservator of the garden of plants at Upsala;—a favour which would have been granted had the situation been in his power to bestow.

As botany was the earliest, so it continued to the last to be the favourite study of Linnæus. His predilection for it is obvious to the most superficial observer of his life and works. From it he drew his greatest happiness during prosperity, and his sweetest consolations in adversity. The sight of a new plant threw him into an ecstacy of delight. In writing, after he had passed his sixtieth year, to a friend in Paris, expressing his eager anxiety for a specimen of the *Loasa*, he says, "If you can give me, or procure for me, a single seed, I would esteem it a treasure." This passion continued unabated to the close of his life; and some have attributed the revival of his intellectual faculties, to the desire he felt to describe the plants which had been sent him by Dalberg from Surinam. It is at least certain, that his latest labours had for their object the publication of a memoir under the title of *Plantæ Surinamenses*. Well might he apply to himself Rousseau's description of the charms of botany,—"I owe my life and my purest pleasures to botany: it is my solace in the midst of disappointments, the soother of my cares, and the sun that sheds a smiling colour on the intervals of misfortune. Had I my own choice, I would spend my days in this delightful study, and even pursue it

beyond the grave; for if there be flowers in the Elysian Fields, I would weave garlands for those good men who deserved them while on earth."

With regard to the peculiar characteristic of the Linnæan system, viz. the sexual distinction of plants, Linnæus himself confessed, both in conversation and in his writings, that the merit of that discovery did not belong to him; it was known before the time of Theophrastus. Nor did he even claim the discovery of the sexual organs, which has been generally ascribed to him. Nevertheless, from his application of that knowledge to the developement of science, he may be justly considered their discoverer. In his *Species Plantarum*, he states that he had analyzed more than ten thousand species of flowers; and although he long swayed the botanical sceptre of Europe, he never expected that the natural system would gain a speedy conquest over the prejudices of the learned. Its adoption he considered as a thing which posterity might witness, but scarcely to be hoped for in his own times.

As a geologist, the opinions of Linnæus, however interesting about the middle of last century, are not now worthy of special analysis. At the period when he formed his theory, there existed no satisfactory *data* as to the structure of the globe. All the systems then in fashion had the common defect of being based on a few isolated facts, too

superficially known to be trusted as a secure groundwork for geological speculation.

Viewed as a Zoologist, Linnæus was the first that gave a picture of the animal kingdom, embracing the whole range of beings that compose it. His classifications are ingenious, and chiefly founded on the organs of mastication, digestion, and lactation; in the form of the wings in birds; on the absence or presence of elytra in insects. Nobody before him had succeeded so well in drawing the line of demarcation between animals and vegetables; no author had hitherto known how to employ synoptical terms with so much brevity and precision. In creating a language for the Natural Sciences, he seemed to have prescribed boundaries which human ignorance could not pass, and to have fixed his definitions beyond the risk of misconception.

Some writers have attempted to compare Linnæus with Aristotle and Buffon; others have honoured him with the title of the Northern Pliny and the second Dioscorides. Those parallels, however, want analogy. To measure Linnæus with other Naturalists, is to contrast Scott and Voltaire with other poets: these men, by the prodigious extent and variety of their works, stand aloof from all comparison. It may be possible to find an equal to Linnæus as a botanist or a zoologist, or even to surpass him as a mineralogist; but where is one to

be found uniting in the same degree all the qualities which constitute these different characters, or capable of achieving so wonderful a reformation in all these several branches of natural history?

Aristotle, considered as a Naturalist, was undoubtedly a man of powerful genius; but independently of his treating more particularly of animals only, we know that for want of materials, and consequently of more extended observation, he was unable to establish accurate or comprehensive classifications. Linnæus, on the other hand, excelled in those qualifications of method and arrangement in which the Greek philosopher was defective. Pliny and Dioscorides succeeded in collecting a vast number of facts, which they arranged methodically; but they seemed incapable of appreciating their value, or of assigning them their proper place in any general system. Their works appear like the point of transition between an age of ignorance, when every thing is amassed without order, and those enlightened times when the human mind, better informed, and consequently more inquisitive, will adopt nothing on hazard, or without ascertaining its relative position among other phenomena of the same class. Those ancient philosophers lived when natural science was yet in embryo. Some of the materials which they supplied were admirably fitted to be incorporated in the edifice reared by Linnæus; but to institute comparisons between them, is to do

injustice to their memory, and betrays a want of power to appreciate their respective merits.

With regard to Buffon, those who would draw a parallel between him and Linnæus, cannot but perceive that there is no true resemblance between them. The Frenchman, though an excellent interpreter of Nature, painted her only in her more striking and general features, clothing his ingenious conceptions and his fascinating hypotheses in a style always pure, free, and eloquent. The Swedish philosopher is the reverse of all this, sacrificing every consideration of style to one quality alone,—that of conciseness; and so remarkable is this condensation, that a single page of his writings has frequently given occasion to long treatises, and even been expanded into voluminous and important works.

Sometimes he is eloquent, too; when admiring the works of creation, or paying a last tribute to the memory of a departed friend, his poetic mind gives utterance to its emotions in the most touching and expressive language. But excepting in these instances, his style was laconic and full of matter. Buffon wished to make Nature appear lovely. Linnæus sought to make her plain and intelligible; he had, moreover, studied her in all her departments, whereas the other rarely seized upon any objects but such as were fitted to make him shine as a writer. Linnæus intended to found a school,

and he succeeded; he also wrote in Latin, the universal language of science in his time. Buffon had no pretensions of this sort; he chose the French tongue, as being that of his countrymen, for whom he wrote. The pupils and successors of Linnæus advanced onwards in the discovery of new objects, taking him for their guide; the continuators of Buffon soon lost sight of their master, and in their efforts to imitate when they could not rival, to give importance to what was insignificant or without real interest, they did injury to the science which they designed to promote.

But whatever may be the difference between the merits of these two distinguished philosophers, it may be truly said that their works form a complete and distinct whole, as they satisfy the two principal intellectual desires of mankind,—that of admiring, and that of becoming acquainted with the works of creation. Of Buffon, it may be said, that he was the painter, and of Linnæus, that he was the expounder of nature; the former equalled her grandeur in his descriptions, the latter resembled her in the vastness and variety of his acquirements.

There are other qualities in which few men of science can be placed in contrast with Linnæus. Though confessed the prince of Naturalists, in the three kingdoms of botany, zoology, and mineralogy, it ought not to be forgotten that he was a profound linguist, since he was charged by the government with assisting in a translation of the Bible into

Swedish;—that he was a distinguished physician, since he published several important works on different branches of medicine;—that he was an able antiquary, since he descanted so learnedly on the ruins which he met with in the isles of Gothland and Oeland;—and finally, that he was an intelligent agriculturist, since he produced a considerable number of treatises on rural economy. But these labours, any one of which might have sufficed to confer distinction on less elevated minds, are scarcely reckoned of any account amidst the vast multitude of his writings.

That Linnæus was a patriot, in the true sense of the word, enthusiastically devoted to the interests of his native country, is abundantly evident from his refusing the flattering offers of foreign princes, who tried to tempt him with large pensions to settle in their dominions. It was his aim to turn his studies and his public works to the advantage of Sweden; the titles which he gave many of them, showed that he wished her to inherit their fame, whilst several of them were expressly intended for improving certain branches of her domestic economy.

The life of Linnæus is a history of the natural sciences during the eighteenth century. Its principal incidents have been touched in the preceding sketch: we have seen him struggling with adversity in his youth; visiting different countries of Europe to gather information, and gratify his ardent passion

for a beloved study; returning to his native land the most accomplished botanist of his age; and finally having all his wishes crowned by being elevated to the chair he most coveted, and one of the highest honours to which, in Sweden, a man of science can aspire. There he reigned supreme, exercising an influence over the world of science unparalleled since the days of Aristotle. In the ancient halls of the Northern Athens he devoted himself exclusively to his professional labours, without mixing with court intrigues, or taking any share in the political events which then agitated Europe. He acquired wealth without selling his independence, and fame without tarnishing the reputation of others.

In bringing this Memoir to a close, it may perhaps gratify the reader to select a few anecdotes illustrating some passages in his life, which have been only briefly alluded to in the foregoing pages. Of his journey to Lapland some notice has been taken; but it is scarcely possible, without reading the tour itself, to form an idea of the fatigues and privations he encountered. In his journal for the month of June 1732, he gives the following account of his adventures in attempting to penetrate the country beyond the river Umea:—

"On Sunday I left Lycksele, taking with me only three loaves of bread and some rein-deer tongues by way of provision. I presumed that I should procure among the Laplanders flesh of the

rein-deer, cheese, milk, fish, fowl, &c.; nor indeed could I well take any thing more at present, for whenever we came to any shoals or falls in the river, it was necessary for my companion to take our boat on his head over mountains and valleys; so that I had not only my own luggage to carry at such times, but his likewise. Having next morning come within the territories of the nearest Laplander, we left our boat on the bank of the river, and went in search of this man through the wild forest, where we saw no more traces of roads or enclosures than if the country had been uninhabited. We met, however, with several deserted huts, where he had at one time or other resided.

"Being exceedingly tired with this walk, I was glad to repose myself here in the desert, while my Finland conductor went in search of my future guide. Nor was I without considerable fears that this man, when he had met with the Laplander, might not be able to find me again; but about noon he returned accompanied by a Laplander, who took charge of me, inviting me home to his hut, where he treated me with fish and fresh water.

"I was afterwards conducted from one Laplander to another, till I came to a part of the river about twenty-five miles above Lycksele, where there was a sort of bay or creek which we were under the necessity of wading through. The water reached above our waists, and was very cold. In the midst of this creek was so deep a hole, that the longest

pole could scarcely fathom it. We had no resource but to lay a pole across it, on which we passed over at the hazard of our lives; and, indeed, when I reached the other side, I congratulated myself in having had a very narrow escape.

"We had next to pass a marshy tract, almost entirely under water for the course of a mile; nor is it easy to conceive the difficulties of the undertaking. At every step we were knee-deep; and if we thought to find a sure footing on some grassy tuft, it proved treacherous, and only sunk us lower. Sometimes we came where no bottom was to be felt, and were obliged to measure back our weary steps; our half-boots were filled with the coldest water, as the frost in some places still remained in the ground. Had our sufferings been inflicted as a capital punishment, they would even in that case have been cruel. What then had we to complain of? I wished I had never undertaken the journey, for all the elements seemed adverse; it rained and blew hard upon us. I wondered I escaped with my life, though certainly not without excessive fatigue and loss of strength.

"By four o'clock in the morning we had conquered all our difficulties, still we could not meet with any Laplander; I was so exhausted that I could proceed no farther without some repose. We therefore struck up a fire, and having wrung the water out of my clothes, I lay down by the side of it in the hopes of taking a little rest; but in this I

was disappointed. The fire scorched me on one side, while the cold north wind pinched me on the other; and the gnats so stung my hands, face, and legs, that it was impossible to sleep. Thus I remained in expectation of my conductor, who had set out in search of another, till two o'clock in the afternoon. I could not help thinking how miserably I might have to end my days here, in case he should think proper to desert me entirely.

"At length he returned quite spent with fatigue, and having made inquiry at many of the huts, but in vain. He brought with him a person whose appearance was such, that at first I did not know whether I beheld a man or a woman. I scarcely believe that any poetical description of a fury could come up to the idea which this Lapland fair one excited. It might well be imagined that she was truly of Stygian origin. Her stature was very diminutive; her face of the darkest brown, from the effects of smoke; her eyes dark and sparkling; her eye-brows black; her pitchy-coloured hair hung loose about her head, upon which she wore a flat red cap. She had a grey petticoat; and from her neck, which resembled the skin of a frog, were suspended a pair of large loose breasts of the same brown complexion, but encompassed, by way of ornament, with brass rings. Round her waist she wore a girdle, and on her feet a pair of half-boots.

"Her first appearance really struck me with

dread; but though a fury in aspect, she addressed me with mingled pity and reserve. "O thou poor man, what hard destiny can have brought thee hither, to a place never visited by any one before? This is the first time I ever beheld a stranger. Thou miserable creature! how didst thou come, and whither wilt thou go? Dost thou not perceive what houses and habitations we have, and with how much difficulty we go to church?" I inquired how far it was to Sorsele. "That we do not know (said she); but in the present state of the roads it is at least seven days' journey from hence."

"My health and strength being by this time materially impaired, by wading through such an extent of marshes laden with my apparel and luggage,—by walking for whole nights together,—by not having for a long time tasted any boiled meat,—by drinking a great quantity of water, as nothing else was to be had,—and by eating nothing but fish unsalted and crawling with vermin; I must have perished but for a piece of dried rein-deer's flesh given me by my kind hostess, the clergyman's wife, at Lycksele. How I longed once more to meet with people who feed on spoon-meat!

"I inquired of this woman whether she could give me any thing to eat; she replied, "Nothing but fish." I looked at the fresh fish, as it was called, but perceiving its mouth to be full of maggots, I had no great appetite to touch it; but

though it abated my hunger, it did not recruit my strength. Finding it impossible to proceed in that direction, I was at last obliged to return the way I came, though very unwillingly, heartily wishing it might never be my fate to see this place again. It was as bad as a visit to Acheron."

His descriptions of the habits and manners of the people are sometimes amusing. "All the Laplanders (says he) are of a small stature, and of a thin slender make. I never saw one of them with a large belly: they do not eat much at a meal, but take food from time to time as they feel inclined. On the other hand, the peasants of Finland cram themselves with as many turnips, and those of Scania with as much flummery, as their stomachs can possibly receive. The inhabitants of Dalecarlia eat till their body is as tight as a drum. The Finlanders (about Tornea) are all blear-eyed, to such a degree as to be nearly blind. I saw many of them who were perfectly deprived of sight; and ninety-nine out of a hundred that were so, had their eyes shut. It seems in vain to prescribe any remedy for this evil, so long as its cause is every where so prevalent. This consists in their smoky dwellings. If I had the management of these Finlanders, I would tie them up to the wall and give them fifteen pair of lashes a piece till they made chimneys to their huts, especially as they have such plenty of firewood. This improvement in the comfort of their dwellings, might surely be

accomplished by the authority of the chief magistrate; for I have not been able to learn any sufficient reason for their adherence to their old way of building. If people thirty or forty years of age are thus afflicted, what must become of them by the time they are seventy?"

Leaving his travels in Lapland, we shall next accompany Linnæus to England, of which journey he has himself given some interesting particulars in his correspondence. As he was too poor to bear the expenses, his friend Clifford, as has been already noticed, advanced the necessary funds. The principal attractions that drew him to this country was the reputation of Sir Hans Sloane, and the splendid museum which he possessed*. He was also desirous of becoming acquainted with Dillenius at Oxford, for whom he professed a high esteem, and to consult the *Pinax* of Sherard. The lively pleasure he felt in seeing the rich landscape scenery of Great Britain, and especially various plants

* The letter of introduction which Boerhaave gave his young friend to Sir Hans, was as complimentary to the English as to the Swedish Naturalist. "Linnæus, who will present you with this letter, is as deserving of your notice as you are of his. Whoever shall have the fortune to meet you both, will see two men whose equals can scarcely be found in the world." A description of Sloane's magnificent collection has been given in the Memoir prefixed to the History of the *Pachydermus*, in a preceding volume of the Naturalist's Library.

which do not grow spontaneously in Sweden, he has expressed in the strongest terms. He speaks particularly of their hedge-rows of hawthorn in flower, of which he could not see enough to satisfy his admiration. It will be more interesting, however, to let him relate his own account of his adventures in England, especially at Oxford, as given in a short extract from his journal.

"After having passed about a year in Holland, I felt a strong inclination to visit England. I spoke of it to Clifford, who at once gave his consent. Thinking it possible to make the voyage in one day, and to return in the same time, I promised him that I should not remain absent more than a week; but I afterwards found that it required the whole of that time to make the passage between Rotterdam and London. Immediately on my arrival, I went to pay my respects to Philip Miller, who had been one principal cause of my visit; he showed me the garden at Chelsea, and named to me several plants according to the nomenclature then in use. For instance, the *Symphytum consolida major, flore luteo.* I said nothing; but next day he remarked to me, 'That fellow Clifford is no botanist, he does not know a single plant.' And as he kept repeating the same names, I took the opportunity of observing,—'Don't you call this plant so and so, and this so and so? We have a much better and a far shorter way of naming them; they ought to be called so and so.' Upon

this he frowned and grew impatient. I was anxious to get from him specimens for the *Hortus Cliffortianus;* but when I went to his house, I found he had gone to London. When he came home in the evening he was in better humour, and promised to give me whatever specimens I might desire. He kept his word; and I set out for Oxford, having proved myself a tolerably good purveyor for Clifford."

At Oxford, Linnæus formed an acquaintance with several distinguished Naturalists; amongst whom was Dr. Shaw, the learned author of Travels in the Levant, who treated him with great kindness. Dillenius at first gave him but a cold reception; as he was persuaded that the young Swede was a dangerous innovator, and had written his *Genera* for the purpose of upsetting the established doctrines of botanical science.

"When I presented myself (continues he) to Dillenius, I found him with Sherard, to whom he remarked,—'Here is the man who confounds all botany.' I pretended not to understand what he said. We then strolled for a short while together in the garden, where I found, for the first time, the *Antirrhinum minus.* I asked him its name. 'How! (exclaimed he), don't you know that plant!'—'No (I answered); but give me a single flower, and I can soon tell you.'—'There (said he), take one;' which I did, and instantly saw to what genus it ought to belong.

"On the third day, finding that Dillenius did not relax in his coldness towards me, and that my money was near an end, I begged him, as I was ignorant of the English language, to send his servant to take a passage for me next day in one of the public vehicles for London. He did so; and then I thought I might ask him another favour, viz. to explain to me the remark which he had made to Sherard at our first interview. This he refused; and upon my insisting, he requested me to walk into the library, where he showed me a copy of my *Genera Plantarum*, of which Gronovius had sent him about the half, without my knowledge; almost every page of which was marked with a *nota bene*. 'What am I to understand by this (said I)?'—'Every one of these marks in your volume (replied he), indicates a false genus.' I maintained the contrary; 'but if I have been unwittingly mistaken (added I), allow me at least to prove my error; and, if wrong, I shall have no hesitation in altering these *genera*.'—'Come, then (said he), let us analyse the first plants we meet with in the garden;' and pulling up a specimen of the *blitum*, which he, as well as other botanists, had described as having three stamina, he handed it to me. I opened the flower, and proved to him that it had but one. 'Ha! (said he), that no doubt is an anomaly.' I opened several others, all of which were alike. We then tried several other genera, and found them all to correspond with my

description. Dillenius looked at me with astonishment. 'You must not leave me (says he); you cannot depart to-morrow.' He kept me in his house a month, and gave me whatever plants I asked for Clifford, who received me on my return to Holland with ecstasies of joy."

Linnæus, although remarkable for politeness, which he never failed to show to strangers, of whom many were drawn by his celebrity to visit Upsala, had nevertheless a turn for pleasantry and humour, which he sometimes indulged to humble vanity, or rebuke conceited ignorance. The following anecdote he used to relate to his students, as a caution to them to take nothing for granted, even on the word of their master, without due investigation:—

"A lady of quality came one day to visit his collections at Upsala, followed by a small lion-shaped dog, whose silky hair almost swept the ground. The venerable Professor accompanied the lady through his different curiosities, doing the honours of the University with his accustomed grace. The questions that she put to him on seeing so many animals, unknown and new to her, were so absurd, that he could hardly refrain from laughing every time she opened her lips. At length, to put an end to her queries, he thought he might create a little amusement at the expense of her ignorance. Fixing his eye attentively upon the dog, he seemed to admire the ingenuity with

which the skin of the animal had been put on. 'The artist (said he) who has given that tender little creature so thick a coating of fur, has shown a wonderful degree of judgment and of skill; for so perfect is his handywork, that the stitches can hardly be detected.'—'Eh! how! what say you? (exclaimed the lady). A false skin!—stitches!—an artist applying fur! That brute, then, is nothing but a little bald monster, covered with a hide not his own! How horribly have I been cheated!' Then removing the hair, she imagined she really discovered the seam in a line slightly marked along the back; which was, in fact, nothing else than the line where the hair separates itself in opposite directions. The poor innocent beast was shunned and execrated as an impostor, and might have fallen into irretrievable disgrace with its enraged mistress, had not Linnæus added, with a smile,—'Calm yourself, madam; the artist that has sewed on the skin is Nature; it is Providence who has given that tender and frail animal a fleece that may enable it to brave the rigours of our northern winters.' The lady perceived the jest; laughed, and took the dog again into favour."

The only other anecdote we shall quote, refers to his academical habits at an advanced period of life. It is related by one of his pupils, Fabricius, well known as a celebrated naturalist.—"I had the good fortune (says he) to enjoy the instructions and the particular acquaintance of Linnæus, from

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1762 till 1764. During all that time I never passed a single day without seeing him, or assisting at his prelections. I followed him to the country, accompanied with two friends, Khun and Zoega, foreigners like myself. In winter we lodged at Upsala, immediately opposite his house. He visited us almost every day, without the least ceremony, in his red dressing-gown, and green cap trimmed with fur, with his pipe in his hand. His conversation was lively and agreeable: he amused us with reciting many anecdotes concerning the Swedish and foreign Naturalists whom he had formerly known; he explained any difficulties that we had met with in the course of our studies; and often favoured us with his own particular views on the subject.

"In our various conversations, it was not uncommon to see him merry and laughing; good humour was depicted on his countenance; and he unbent himself with a frankness and affability of manner, which showed his natural disposition for conviviality. The time we spent with him in the country was no less agreeable; we lodged in the thatched cottage of a peasant, a very short distance from his house, where he often came to see us at six in the morning; and after breakfast, used to explain to us the natural order of plants, till ten. We then accompanied him to the neighbouring rocks, where he occupied himself in describing and detailing their different productions, till noon, his usual

time of dinner. We returned to him afterwards, and spent the evening in his society."

It was his custom to make a botanical excursion every Saturday, and on these occasions he was always accompanied with a joyous troop of attendants, amounting often to 150 pupils, collected from all quarters of the world. They were divided into small bands, and after dispersing themselves over the country, they met again at the place and hour appointed, to give an account of their discoveries, and hear the explanations of their master. Linnæus kept near himself only the best informed of the class; and it was not unfrequent to hear them, when returning to their place of rendezvous, raising shouts of joy, which the venerable professor never attempted to repress. As soon as they had all arrived, he classified and described the plants that had been gathered; and when this was done, a table, with about twenty covers, was immediately spread and loaded with fruits, cheese, milk, and other viands. Those of the pupils who had discovered the rarest plants, or determined the greatest number, took their seats at the table with their master; the rest partook of the refreshment standing, but not without hopes of one day meriting the honour which they all so much envied, and which served to keep up among them a powerful spirit of emulation.

As might have been expected from his great ability, the honours and tributes of respect conferred upon him after his death, were exceedingly numerous.

The Academy of Stockholm caused his portrait to be engraved at Paris; a monument was erected to him at Edinburgh; and another by the Duke of Noailles in his garden; the latter was a cenotaph with a bust, and a medallion bearing an appropriate inscription. His name was assumed by Botanical Societies in different parts of Europe; and the learned of all nations seemed to vie with each other in the sincerity of their regret for his loss. The Academy of Belles Lettres and History at Stockholm, instituted a prize for the best eulogium upon him, to be composed in Latin, French, or Italian. The King of Sweden caused a medal to be struck, on one side of which was the head of Linnæus, and on the obverse a mourning Cybele, surrounded by animals and plants, with the motto—"*Deam luctus angit amissi.*" The terms in which his Majesty expressed himself before the Diet of the States, show how deeply he felt the loss which Science had sustained by the death of its greatest ornament. "I shall never forget (says he) those marks of attachment which I received in the University of Upsala before I mounted the throne. There I founded a new chair; but, alas! I have lost a man whose renown filled the universe, and whom Sweden will ever be proud to number among her children. Long will this ancient city remember how much of her celebrity she owes to him who bears the name of Linnæus."

After so many tokens of regard lavished upon

Linnæus by his king and his countrymen, it is apt to astonish foreigners to learn, that the Collections of that distinguished Naturalist were allowed to be transported from Sweden, as has been already noticed, and to become the property of an Englishman. The circumstance is thus related by one of the biographers of Linnæus:—"In Sweden, it is alleged, that there exists a law which vests in the State a right of inheriting part of the effects of the deceased, in all cases where he has exercised any of the functions connected with Professorships in the Universities. Madam Linnæus, apprehensive lest, on the death of her son, the collections of her husband might be seized by the government, made a secret offer of his herbarium and library to Sir Joseph Banks; but the latter not being then in a condition to make so extensive a purchase, mentioned it to Mr. (afterwards Sir James) Smith, who at once saw the importance of such an acquisition. The sum demanded by the widow was 1000 livres; Mr. Smith offered 900, which were accepted. The English consul at Upsala was privately entrusted with the charge of conveying away the precious cargo; but some knowledge of the circumstance having transpired, the people were dissatisfied, and threatened to oppose the removal of the cabinets. The King, when informed of the transaction entered into between Mr. Smith and the widow, implored the latter to preserve for Sweden those valuable collections of which she was on the point

of being deprived; assuring her, that he would himself reimburse her for any loss or inconvenience she might suffer from a breach of contract. But the offer came too late; for by that time the treasure had been embarked on board an English vessel in one of the neighbouring ports. His majesty then immediately ordered an armed frigate to be got ready; but meanwhile the Englishman had sailed; the Swedes gave chase; and had they been able to make up to her, a rencontre might have ensued, and the world might perhaps have seen the waters of the Baltic stained with blood, in a dispute about possessing the scientific remains of a peaceful Naturalist. The frigate continued the pursuit until she saw her rival enter an English port full sail, landing in safety those cherished relics, the loss of which must ever be a subject of national regret to Sweden."

ORNITHOLOGY.

NATURAL HISTORY OF HUMMING-BIRDS.

His silken vest was purfled o'er with green,
And crimson rose-leaves wrought the sprigs between;
His diadem, a topaz, beam'd so bright,
The moon was dazzled with its purest light.

THE geographical distribution of the various races of created beings has of late excited considerable interest, and a mass of facts have been collected which go far to prove that it is regulated by certain laws, chiefly dependent upon the conjoined influences of climate and temperature. Birds are equally subject to those rules, though, as might be suspected from their more extended locomotive powers, their ranges are wider, and some groups and species are more generally spread over the world than those beings which require the assistance of a solid medium to transport themselves from place to place. Instances of this may be given in one or two examples. The great families of the falcons, pigeons, and swallows, are universally diffused; parrots are found in every

quarter of the world except Europe; and woodpeckers are wanting only to New Holland. The peregrine falcon, so renowned in a noble, but nearly forgotten, sport, has its free range over the greater part of Europe, America, and Greenland, and has been sent from the distant continent of New Holland; the short-eared owl is common to Europe, Siberia, North America, and the neighbourhood of Canton in China, and Pennant mentions it as an inhabitant of the Falkland Islands; the common magpie extends over Europe, has been sent from the Himmalayan range in India, and reaches to the cold regions of North America; while specimens of the glossy ibis have reached this country from each of the four quarters of the world, besides from many of its far distant insulated lands.

At variance, however, with this, we sometimes also find the large continents possessing some peculiar forms; but, as if the economy of each great land could not be properly supported without an organization somewhat analogous, there is, in most instances, a representative, modified and adapted to the region it is destined to inhabit. Thus, America has the South American ostrich, or nandu, inhabiting the vast grassy pampas of Paraguay, and extending nearly to the Straits of Magellan; India, and her great archipelago of islands, particularly the Moluccas and Borneo, possess the cassuary; Africa, the true ostrich; and New Holland, the emeu. The Great Sahara, and the deserts of Arabia, little fitted for the abode of any animal creation, have their peculiarities in the coursers

and ganga, or sand-grouse, beautifully formed for abode in these weary solitudes. They sweep them with a flight as rapid as the mighty hurricane, and receive as much enjoyment in a boundless waste, as the ruff-necked and pheasant-tailed grouse in the rich and luxuriant prairies of North America, or our native moorfowl on the heath-clad knolls of its Highland hills. In like manner do Africa and India, in their creepers and honeysuckers, present splendid types to a class of fairy birds nearly confined to the deep and shady forests of tropical America.

The beautiful and delicate beings to which we must now particularly direct the attention of our readers, appear to have excited the admiration of their discoverers, and, indeed, of every one who has observed them, either reveling in their native glades, or at rest in the more artificial display of our museums, by the spirited proportions of their form, and the dazzling splendour of their plumage.

——— "Delicate and beautiful,
Thick without burden, close as fishes' scales."

The ancient Mexicans used their feathers for superb mantles in the time of Montezuma,* and the pictures

* The nation of the Aztecs call their capital Tzinzunzan, from the number of humming-birds in its vicinity, with which the statues of their gods are adorned; and the Indians of Patzquara are still famous for this art. They compose figures of saints with the feathers of the colibri, which are remarkable for the delicacy of the execution, and the brilliancy of the colours.—*Ward's Mexico in* 1827.

so much extolled by Cortes were embroidered with their skins;—the Indian could appreciate their loveliness, delighting to adorn his bride with gems and jewellery plucked from the starry frontlets of these beauteous forms. Every epithet which the ingenuity of language could invent, has been employed to depict the richness of their colouring; the lustres of the topaz, of emeralds, and rubies, have been compared with them, and applied in their names. "The hue of roses steeped in liquid fire," and even the "cheveux de l'astre du jour" of the imaginative Buffon, fall short of their versatile tints.* Let us enquire, however, whether an exterior of "gorgeous plumery" is all which they possess, and if there is no beautiful adaptation of structure to supply the wants of so frail a tenement.

The humming-birds, or what are known by the genus *Trochilus* of Linnæus, have lately received vast additions to the number of their species, and, though forming a large and closely connected group, they exhibit a great variety of forms and characters, which are not easily comprehended in the old twofold division, "into those with straight, and those with curved bills." They have been, accordingly, divided by modern ornithologists into various sections and genera, which will be detailed in that part of our work devoted to their classical arrangement.

We previously mentioned that these birds were

* Their name in the Indian language is Beams or Locks of the Sun.

nearly confined to the tropical portions of the New World, and, according to our best information, that great archipelago of islands between Florida and the mouths of the Orinoco, with the mainland of the southern continent, until it passes the Tropic of Capricorn, literally swarms with them.* In the wild and uncultivated parts, they inhabit those forests of magnificent timber overhung with lianas and the superb tribe of bignonaceæ, the huge trunks clothed with a rich drapery of parasites, whose blossoms only give way in beauty to the sparkling tints of their airy tenants; but since the cultivation of various parts of the country, they abound in the gardens, and seem to delight in society, becoming familiar and destitute of fear, hovering over one side of a shrub, while the fruit or flowers is plucked from that opposite. As we recede from the tropics, on either side, the numbers decrease, though some species are found in Mexico, and others in Peru, which do not appear to exist elsewhere. Thus Mr Bullock discovered several species at a high elevation, and consequently low temperature, on the lofty table lands of Mexico, and in the woods in the vicinity of the snowy mountains of Orizabo; while Captain King, in the late survey of the southern coasts, met with numerous members of this diminutive family flying about in a snow-storm near the Straits of Magellan, and discovered two species, which he considered undescribed, in the remote island of

* It is remarked by Lesson, that the colibris, or those species with curved bills, never pass the intertropical limits.

Juan Fernandez.* Two species only extend far into the northern continent of America. The one, the ruff-necked humming-bird, (*Selasphorus rufus*, Swainson,) was discovered by Captain Cook in Nootka Sound, and has been traced by Kotzebue to the 61° along the western shores; the other, the northern humming-bird, (*Trochilus colubris*, Linnæus,) so beautifully described by Wilson, has been obtained from the plains of the Saskachewan, and was found breeding by Mr Drummond near the sources of the Elk River; it is know to reach as far north as the 57th parallel.

The best accounts of the habits and economy of the humming-birds are those given by Wilson and Audubon, in their histories of the northern or ruby-throated humming-bird; and by Bullock, of several species which are found in Mexico and in the island of Jamaica. And from the little we have been able to glean from other writers, there appears to exist great similarity in their manners. They are of a lively and active disposition, almost constantly on the wing, and performing all their motions with great rapidity; their flight is in darts, and it is at this time, in a brilliant sun, that the variations of their plumage are displayed with the greatest advantage.

> "Each rapid movement gives a different dye;
> Like scales of burnish'd gold they dazzling show,
> Now sink to shade—now like a furnace glow."

* *Trochilus Fernandensis*, and *T. Stokesii*, King.—*Reports of Zool. Soc.* for Jan. 1831.—Mon. Berters, a French botanist, remained on the island of Juan Fernandez to examine its vegetable productions, and records that three species exist on it.

But when performing a lengthened flight, as during migration, they pass through the air in long undulations, raising themselves for some distance, and then falling in a curve. When about to feed, or in search of a favourite flower, they hover stationary, surveying all around, and suddenly dart off to the object. "I have often stopped," says Wilson, "with pleasure, to observe their manœuvres among the blossoms of a trumpet-flower. When arrived before a thicket of these that are in full bloom, he poises or suspends himself on wing, for the space of two or three seconds, so steadily, that his wings become invisible, or only like a mist." And Bullock says, "they remain suspended in the air in a space barely sufficient for them to move their wings, and the humming noise proceeds entirely from the surprising velocity with which they perform that motion, by which they will keep their bodies in the air, apparently motionless, for hours together." An older writer, Fermin, a Surinam physician, compares this action to the balancing of the bee-like flies over fœtid waters; perhaps it may be also likened to the motions of a large hawk-moth before alighting on a flower.

"They seldom alight upon the ground, but perch easily on branches. The ruby-throated humming-birds settle on twigs and branches, where they move, sidewise in prettily measured steps, frequently opening and closing their wings, pluming, stroking, and arranging the whole of their apparel, with neatness and activity. They are particularly fond of spread-

ing one wing at a time, and passing each of the quill-feathers through their bill in its whole length, when, if the sun is shining, the wing thus plumed is rendered extremely transparent and light." *

They are also possessed of boldness and familiarity. Wilson has seen them attack and tease the king-bird, and among themselves they are exceedingly pugnacious, two males seldom meeting on the same bush or flower without a battle. In the gardens they flutter about without heeding intruders. "A person standing by the side of a common althea in bloom, will be surprised to hear the humming of their wings, and then see the birds themselves within a few feet of him." And Wilson mentions one so familiar as to enter a room by the window, examine the bouquets of flowers, and pass out by the opposite door. The same was known to take refuge in a hothouse during the cool nights of autumn, to go regularly out in the morning, and to return as regularly in the evening, for several days together.

During the breeding season, if the nest is approached, they dart round with a humming sound, often passing within a few inches of the person; and should the young be newly hatched, the female will almost immediately resume her seat, though the intruders continue within a few yards distance. The intrepidity and jealousy of a diminutive Mexican species, (*T. cyanopogon*—Mexican star,) according to Mr Bullock, far exceeds the quiet courage of the northern

* Audubon.

birds. "When attending their young, they attack any bird indiscriminately that approaches the nest. Their motions, when under the influence of anger or fear, are very violent, and their flights rapid as an arrow. The eye cannot follow them, but the shrill piercing shriek which they utter on the wing, may be heard when the bird is invisible, and often led to their destruction by preparing me for their approach. They attack the eyes of the larger birds, and their sharp needle-like bill is a truly formidable weapon in this kind of warfare. Nothing can exceed their fierceness when one of their own species invades their territory during the breeding season; under the influence of jealousy they become perfect furies; their throats swell; their crests, tails, and wings expand; they fight in the air, uttering a shrill noise, till one falls exhausted to the ground." And an older writer, Fernando Oviedo, still farther confirms their boldness:—"When they see a man climb the tree where they have their nests, they flee at his face, and stryke him in the eyes, commying, goying, and returnying, with such swyftness, that no man woulde ryghtly beleive it that hath not seen it."

The nests are built with great delicacy, but at the same time with much compactness and warmth. Wilson thus describes the situation and workmanship of the northern, or ruby-throated humming-bird, and which is also confirmed by Audubon. "It is generally fixed on the upper side of a horizontal branch, not among the twigs. Yet I have known instances where

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it was attached by the side to an old moss-grown trunk; and others, where it was fastened on a strong rank stalk, or weed, in the garden. In the woods it often chooses a white oak sapling, and the branch is seldom more than ten feet from the ground. The nest is about an inch in diameter, and as much in depth; the outward coat is formed of small pieces of a species of bluish-gray lichen, that vegetates on old trees and fences, thickly glued with the saliva of the bird, giving firmness and consistency to the whole, as well as keeping out moisture. Within this are thick, matted layers of the fine wings of certain flying seeds, closely laid together; and lastly, the downy substance from the great mullein, and from the stalks of the common fern, lines the whole. The base of the nest is continued round the stem of the branch, to which it closely adheres, and when viewed from below, appears a mere mossy knot or accidental protuberance." On the plains, near the Elk River, the nest of this hardy bird was built of the materials that were most appropriate in the country; the downy seeds of an anemone, bound with a few stalks of moss and lichen.

Lesson describes the nest of *Trochilus pella* as principally composed of a spongy cellular substance, apparently similar to that of a fungus of which some species of wasps build large habitations, suspended from the branches of trees in the virgin forests of Guiana; and the same naturalist has given a curious figure of the nest of *T. cristata* ? composed entirely of the down of some thistle; the seed is attached, and is

placed outwards, giving a jagged or prickly appearance to the outside, while the interior is warmly lined with the down. Dr Latham says, that the nest of the black humming-bird is also made of cotton, entwined round the thorns and twigs of the citron-tree, and is of so firm a texture as not to be easily broken by the winds; and a nest of the topaz-crested humming-bird, now before me, about seven-eighths of an inch in diameter, is composed of the same materials, stuck over with lichens on the outside, and firmly fixed in the hanging cleft of some strong creeper by threads of a cottony substance, and very slender roots or tendrils, the whole lower part as if cemented by a thin coat of glue. It is probable that the greater number build their nests nearly in a similar manner, and in proportion to their size, though there are also some variation in the different forms, which a little more attention may allow us to introduce in our reasoning upon their affinities. Thus, in some valuable remarks accompanying a collection of birds from Tobago, we have, regarding the *T. hirsutus*, (provincially named doctor humming-bird,) —"It builds its nest suspended like that of the yellow-tail, (*Cassicus cristatus*,) with the entrance somewhat downwards, and lays only *one* egg." The nest received is of a lengthened form, composed of dried grass and slender roots, moss, &c., and does not show the compact manufacture of those previously described. It is suspended to the leaf of some reed-like plant, to which it is cemented chiefly by the threads of spiders or caterpillars. I trust erelong to procure some interest-

ing answers to my queries from the same source. Our materials at present to judge from are, however, very scanty. There is one provision apparent in the whole, that for warmth,—and most necessary, when we consider the small bulk of the owners to retain the animal heat.

Most writers agree in the fact, that humming-birds lay only two eggs, but we have seen that the *T. hirsutus* lays only one. This small fecundity, with the many casualties which are liable to destroy them, the vicissitudes of season and the assaults of various animals, birds, and even insects, will give us some idea in what immense profusion these little birds exist, when two, or at most four, is the number of young reared in a season. The eggs are not so small in proportion as one would imagine on looking at the bird. That of the topaz-crested humming-bird is nearly $\frac{5}{8}$ of an inch in length, and about $\frac{3}{8}$ in diameter. In shape they are nearly a complete oval, and are pure and delicate white. The period of incubation is remarkably short. Latham says that the black humming-bird sits twelve days, and that the young leave the nest and follow their parents in eighteen days; and the North American species, according to Audubon, hatches only ten days, and the young are ready to fly in one week.

The desire to possess creatures of such beauty in a tame state, has induced persons often to try the experiment of keeping them in cages, though yet comparatively without success. The attempts which have been made, however, do not preclude a possibility, by

perseverance, of ever bringing them to this country. Bullock said that he had nearly seventy in cages, that no bird was more easily reconciled to its new situation, and that by attention they might easily have been brought to Europe. We learn also from Azara, Wilson, and other sources, that they have been frequently kept in their native countries for several months on sugar or honey and water, assisted by the insects which were attracted by and drowned in the sweets; and Charles Peale, proprietor of the Philadelphia Museum, reared two from the nest, which became so tame as to perch on Mrs Peale's shoulder.

The only instance of their being carried to a different climate is thus related by Latham; and there can be little doubt, from the partial success of these attempts, that great care and greater experience, with a more perfect knowledge of their proper food, would enable them to reach this country, and perhaps adorn a separate apartment in some conservatory. The European summer birds of passage have been now successfully kept in confinement for several years, and an attempt upon similar principles might prosper.

It was a mango humming-bird (*T. mango*) which was successfully brought to England,—"A young gentleman, a few days before he sailed from Jamaica for England, met with a female humming-bird sitting on the nest and eggs, and cutting off the twig, he brought altogether on board. The bird became sufficiently tame to suffer herself to be fed on honey and

water during the passage, and hatched two young ones. The mother, however, did not long survive, but the young were brought to England, and continued for some time in the possession of Lady Hammond. The little creatures readily took honey from the lips of Lady Hammond, and though the one did not live long, the other survived for at least two months from the time of their arrival."

The food of the humming-birds was always considered to be only the honey or sweet juices extracted from the nectaria of flowers; but later observations have proved that this alone was not sufficient to preserve even such small bodies; and when we compare the structure of the tongue with that of birds which use that member for darting suddenly out and catching up small objects, we shall find considerable resemblance, and the adaptation is farther confirmed by the reality of their food being in a measure insectivorous. Audubon found even coleopterous insects in their stomach, and Wilson observes—"I have seen the humming-bird, for half an hour at a time, darting at those little groups of insects that dance in the air in a fine summer evening, retiring to an adjoining twig to rest, and renewing the attack with a dexterity that sets all other fly-catchers at defiance." And in all the deep tubular flowers in which they so much delight, such as the different daturæ, the bignonaceæ, &c., I have no doubt that insects are as often withdrawn by their active and viscid tongue as any portion of the honey.

But of the various ways employed by these birds to procure an insect prey, the most singular as well as dangerous to themselves, is that of seizing the half-dead entangled flies from the webs of the large Mexican bird-spider—whose name implies a power to seize and detain some of the weaker at least of the feathered race. It is thus detailed by Mr Bullock, and is so curious that the account must be given without abridgement:—"The house I resided in at Zalappa for several weeks, on my return to Vera Cruz, was only one story high, enclosing, like most of the Spanish houses, a small garden in the centre, the roof projecting six or seven feet from the walls, covering a walk all round, and leaving a small space only between the tiles and the trees which grew in the centre. From the edges of these tiles to the branches of the trees in the garden, the spiders had spread their innumerable webs so closely and compactly, that they resembled a net. I have frequently watched, with much amusement, the cautious peregrinations of the humming-bird, who, advancing beneath the web, entered the various labyrinths and cells in search of entangled flies; but as the larger spiders did not tamely surrender their booty, the invader was often compelled to retreat. Being within a few feet, I could observe all their evolutions with great precision. The active little bird generally passed once or twice round the court, as if to reconnoitre his ground, and commenced his attack by going carefully under the nets of the wily insect, and seizing by surprise the smallest entangled flies, or those that

were most feeble. In ascending the angular traps of the spider, great care and skill was required; sometimes he had scarcely room for his little wings to perform their office, and the least deviation would have entangled him in the complex machinery of the web, and involved him in ruin. It was only the works of the smallest spider that he durst attack, as the largest rose to the defence of their citadels, when the besieger would shoot off like a sunbeam, and could only be traced by the luminous glow of his refulgent colours. The bird generally spent about ten minutes in this predatory excursion, and then alighted on the branch of an avocata to rest and refresh himself."

In the preceding pages we have endeavoured to give a short history of the distribution and economy of this interesting family, deriving our information from those sources which we judged were most worthy of credence, and always, when possible, from observers who had seen the birds in their wild state, and untrammeled by any restraint. The examination of their structure will have the next claim to our attention, with its adaptation to the habits we have already attempted to describe.

When we examine attentively the structure of any bird, we soon come to the conclusion that the most important parts of its outward form are those organs which serve for the means of transporting it from place to place. On presenting a humming-bird to the most common observer, the first exclamation generally is, "What a beautiful little creature!" The second,

'But what large wings it has!" Such, indeed, is the case, and in most instances the size of the wings and strength of their quills are entirely out of proportion to our ideas of symmetry in a creature clothed with feathers; but, upon comparing them with its necessities, and the other parts of its frame, their utility and design become obvious. All their other parts, not called into action during flight, are very slender, almost frail; their tarsi are short, and the feet small, so as not to incommode during flight, while they point out an inability for any long support, or assistance in procuring sustenance, by climbing or hanging in various positions, as we see employed by the titmice, and many of the slender-billed warblers. Their food is derived from the sweet nectar of flowers, or from insects which must either be taken in a rapid flight, or withdrawn from the deep tube, or cup-shaped recesses of blossoms which grow and hang in every direction, and which it would be impossible to reach, unless by suspension above or under. Another great necessity for their possessing organs of such power, is to enable them to pass in safety through the migrations, and the long flights which are sometimes necessary for their preservation, and during which they have often to withstand a passing gale, showers, or even the rigour of a snow-storm. The beautiful climes where we have seen they inhabit, are at seasons subject to perpetual rains, which drench and almost inundate their abodes, or to hurricanes, that in a few minutes leave only a wreck of all that was

before so magnificent and luxuriant; and they pass by these means before the dangerous season, to districts where the reparation of a previous wreck is proceeding with all the magical rapidity of tropical vegetation.

The form of the wings is very nearly similar to those of the swift, (*Cypselus*, Illiger,) whose power of flight every one is acquainted with. They in general exceed the tail in length, unless when that member is extraordinarily developed. The exterior outline of

the wing is very much curved, and the first quill is always longest, the others shortening gradually. The secondaries are very short, and the lesser wing-coverts occupy little space. The plumulets of the quills are narrow and compact, firmly united together, forming a substance, when used, almost like a thin plate of whalebone, and which, by presenting resistance to the air when struck, and allowing no part to pass through the webs, as in nocturnal feeding birds, produces that humming sound which is heard during their suspension, and whence their common name has been applied. In all, the shafts of the quills are remarkably strong and elastic, but in a few species, known

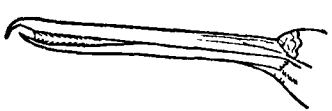
under the denomination of sickle or sabre-winged humming-birds, and forming the genus *Campylopterus* of Swainson, they are developed to an extraordinary degree at the base, and nearly equal the breadth of the plume.

The birds composing this division are large, but not the largest of the family; and our present information of their habits does not point out any peculiarity to which this development is adapted. It, besides, is wanting, or in a great measure reduced, in the females of some of them. Mr Swainson has figured two birds, which seem almost identical, except in the absence of the broad shaft in the one; and in specimens of the sabre-wing, which we have figured at Plate XXXIV, the shafts of the female bird were in breadth only about one-half.

The organ of next importance, as directing the flight, is the tail. This is always powerful, and presents every modification which we find in those birds endowed with powerful or rapid flight, and will be of use to the systematist in directing the forms which present themselves in analogy with the other families

of the feathered race. In one species* it presents a very curious anomaly among birds, by being composed of only six feathers. This species is rare, and I have had no opportunity for an examination; but the testimonies of Temminck and Lesson show that it is not an accidental variation, but that it remains constant in all the birds which they have examined.

The bill is always an important organ in birds. This family presents great modification of form, which will be seen by inspecting the plates, and will be farther illustrated when we characterise the divisions. But although most of the species are partly insectivorous, and take a great portion of their food in the air, we find no rictorial bristles or great development at the base, as among the truly insectivorous tribes; and except in one or two instances, no very evident appropriation of structure. In a few species the edges of the mandibles are toothed, (see Plates I. II. and III.,) and in the individuals which form the genus *Ramphodon* of Lesson, this member is furnished

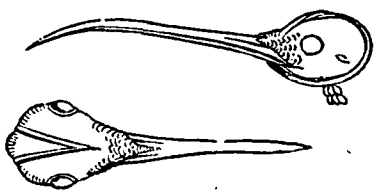


with recurved saw-like teeth, a manifest provision for more effectually securing some peculiar prey.

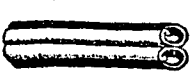
The tongue and its accessory parts show a greater

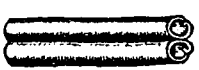
* See Plate XXVII.

resemblance to the scansorial insectivorous birds, being in fact nearly similar in their formation to those of the woodpeckers. The os hyoides passes round the back part of the skull, and its horns, or extremities, when joined, reach forward beyond the line of the eyes.



The tongue is very long, and by the structure of its parts above mentioned, is retractile, and capable of being darted out with considerable force. It is composed, according to Brisson and Lesson, (which we have confirmed as far as the examination of the moistened parts would allow,) of two muscular tubes joined together for the greater part of their length; towards

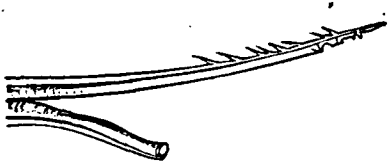




the tip, broadened or swelling, and, according to Lesson, terminated in a spoonlike point on the up-

per surface. They assist in retaining the different substances, which are immediately conveyed to the

opening of the œsophagus by the contractility of the tubes. Our own examination, however, of the tongue of the *Trochilus moschitus*, relaxed with warm water, gave the appearance of a fimbriated opening



at the tip, having the exterior margin of each fork set with recurved sharp-pointed pliable spines, as if to assist its viscidity in securing any substance seized by them.

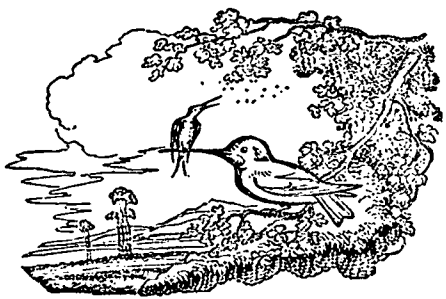
Their feet, as we have before said, are small and slender, and in general present the form which we see among the kingfishers, bee-eaters, and jackamars. The claws are rather large in proportion, very much hooked, very sharp, and may thereby assist in securing a firmer grasp, but which is evidently little needed in their economy. For one purpose they would be useful, if Mr Bullock is correct in his observations; that gentleman remarks, that, " in sleeping they fre-

quently suspend themselves by the feet, with their heads downwards, in the manner of some parrots."

The structure of the feathers, which shine with so much lustre, has occupied the attention of most of their describers. Audebert has tried to demonstrate the cause on mathematical principles, the form of the feathers, and the manner in which the light strikes them; while Lesson is of opinion, that the colours are due to elements contained in the blood, and diffused by circulation. He says, at the same time, that all the barbules and plumulets are deeply furrowed in the centre, and the light, when striking vertically, produces no colour, or only black; but when striking transversely, every opposite side of the furrow acts as a reflector to the others, and in this way assists in producing the colours.

Bullock, when speaking of the same subject, says, that "the preserved specimens were but the shadow in brilliancy to what they were in life. The reason is obvious; for the sides of the laminæ, or fibres of each feather, being of a different colour from the surface, will change when seen in a front or oblique direction; and as each lamina or fibre turns upon the axis of the quill, the least motion, when living, causes the feathers to change suddenly to the most opposite hues." We have thought it proper to mention those different opinions; and though they do not entirely coincide with our own, we are not at present able to explain all the causes. In birds possessing this shining and metallic variation of lustre, we have found the struc-

ture of the feathers exhibiting them so various, that the effects must be produced in several ways. Diagrams of many of these have been from time to time made; and when a little more complete, an opportunity will be taken of introducing them, in illustration of this curious subject.



DESCRIPTIONS.

THE following plates, with their descriptions, have been made as much as possible from specimens of the birds themselves, but when these could not be procured, they are taken from those works which could be most relied upon for their accuracy. We have accordingly availed ourselves generally of Lesson's splendid monograph of this family, and of Temminck's *Planches Coloriees*. For the plate of the sabre-winged humming-bird, we are indebted to Mr Swainson, who kindly permitted his beautiful figure, in the first series of the *Zoological Illustrations*, to be copied, and specimens of the bird itself having since reached us, have served for the description.

The systematic arrangement of this family presents considerable difficulties. Mr Swainson has given the characters of what he considers the five leading groups, and has also formed several subgenera. M. Lesson has also instituted several families and genera, and we understand that Mr Lodiges, who possesses a collection unrivaled by any in Europe, has lately been engaged in working out their proper arrangement.

The desire to procure every information previous to forming any decided opinion, has therefore determined us to attempt no arrangement in the present volume, and, with two exceptions, to retain the whole under the family name of *Trochilus*. The genera which have been adopted, are illustrated in the first and last plates.

In a second volume now in preparation, it is intended to figure thirty-five or forty additional species, and with these to give the characters of the families and genera which have been instituted, illustrating the parts and dissections by woodcuts; to add a systematic synopsis of the species which have been described, and in this manner endeavour to complete the natural history of the group.

PLATE I.

RAMPHODON NÆVIUS.

SPOTTED SAW-BILLED HUMMING-BIRD.*

Ramphodon nævius.—Lesson.

Plate I.—Male.

Trochilus nævius, *Dumont Dictionnaire des Sciences Naturelles*, x. 55.—Colibri tacheté, Trochilus nævius, *Temminck*, *Planches Coloriées*, cxx. fig. 3.—Le Ramphodon tacheté, Ramphodon maculatum, *Lesson*, *Histoire Naturelle des Colibris*, pl. i.

We mentioned in the introductory part of the work, that among the humming-birds we did not generally meet with, in the form of the bill, any evident provision for securing an insect prey as among the truly insectivorous tribes, farther than the retractile tongue. For the species now figured, there is, however, an exception in the strong and rather broad bill, furnished upon each edge of the mandibles with strong recurved teeth, evidently intended to assist in securing some peculiar prey, and reminding us by this formation, and the sharp hooked point, of some water-fowl which are provided with these requisites, for seizing a plun-

* It may be here mentioned, that all the figures in this volume are represented of the natural size.

der at once slippery and vigilant. In none of the descriptions do we find any notice taken of the adaptation of this structure, and we are yet in the dark regarding the manner in which it is employed. In the two next plates, where the bill presents also a very curious form, we have the edges toothed in a weaker degree, and Mr Swainson is of opinion that the turned up form assists also in procuring some peculiar nourishment.

This species was discovered in Brasil by MM. Delalande and Naterer, chiefly on the mountains of Coreovado, in the vicinity of Rio Janeiro. It is not generally common in collections, though Lesson says that in Paris many specimens are now to be found.

The length of the bird, including the bill, is about five inches and a half; the crown, back, and shoulders, are olive green, with metallic reflections, which are much brighter on the shoulders and wing-coverts. The auricular feathers, and a patch extending down the sides of the neck, are of a bright reddish-brown, darker below the eye, and at the tips of the auriculars, where it assists in relieving a streak from the eye, of the same colour, but of a paler tinge. The wings are strong, and with the very powerful shafts, are of a rich purplish brown. The tail is very much rounded; the centre feathers, and the base of the outer ones, are of the same colour with the wings, and the tips of the outer feathers are of a pale yellowish brown, the pale colour covering the tip only of those next the centre, gradually extending in length upon those on the out

side, and contrasting finely with the dark parts; the feet are remarkably small and slender. M. Lesson has formed from this species his subgenus *Ramphodon*, under which it should now stand. It is yet a solitary representative, and the female is unnoticed by any ornithological writer.

AVOSET-BILLED HUMMING-BIRD

Trochilus avocetta.—Lesson.

Plate II.

L'Oiseau-mouche avocette, Ornismya avocetta, *Lesson*, *Histoire Naturelle des Oiseaux-mouches*, pl. xxiv.

The curious form and structure of the bill of the birds figured on this and the following plates, first attracted the attention of Mr Swainson, who gave an excellent representation of the latter on plate 105 of his *Illustrations*, from specimens procured in Peru by Mr Bullock. Upon the publication of M. Lesson's beautiful monograph of this family, he was obliged to have recourse to Mr Swainson's figure, to gratify (he observes) the French amateurs with the representation of a bird so rare and curious, no specimen at this time existing in the Paris collections. Soon after, an accession of species previously unknown to him, occasioned the continuation of the monograph by a supplement, and he has in it figured two birds, the one as identical with *T. recurvirostris*, Swainson, the other given under the title of *T. avocetta*, and considered by that ornithologist as the young of some new and undescribed

PLATE 2

TROCHILUS AVOCETTA

(Avoset-billed Humming Bird)

Lizars sc

species. There is very considerable alliance between them, but it is impossible to decide, without a more extensive examination of specimens than we at present possess; and copies of Lesson's beautiful plates have been introduced, more from the desire to exhibit the curious form of the bill, than to discriminate the species.

We provisionally retain Lesson's name for this bird, and nearly translate his description. With the next, the descriptions of both Lesson and Swainson are given.

The individual from which the accompanying plate was taken, is part of the collection of M. Longuemare in Paris, and was received from Cayenne. The length is about three inches and six lines, of which the bill occupies nearly seven lines; the bill is black, rather strong, assumes a singular bend upwards, and has the extremity of each mandible very fine, and slightly flattened. The wings equal the tail in length, and are of a brownish purple; the tail is large, and on both sides is of a dull blackish blue; the upper part of the head, the back, rump, and shoulders, are of a golden green; a patch of emerald green occupies the forepart of the neck, and is bordered by a lateral line of white, which reaches almost to the crissum; from the green of the neck, a broad patch of deep black stretches along the centre of the belly, and is also bordered by the white streak above mentioned; the flanks are of a greenish brown, and the under coverts are brownish.

RECURVED-BILLED HUMMING-BIRD.

Trochilus recurvirostris.—Swainson.

Plate III. Young.

Recurved-billed Humming-bird, *Swainson, Zoological Illustrations*, 1st series, pl. cv.—Oiseau-mouche à bec recourbé, Ornismya recurvirostris, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. xxxvii. p. 129, and *Supplement*, pl. xxxiv. p. 166.

It has been asserted by some ornithologists, that the curvature of the bill in these birds was an accidental formation, or received in transportation, from the position in which the specimen was laid. This was maintained as long as Mr Swainson's specimen was the only one generally known; but we have already mentioned two with the same formation, and Lesson says, that he has seen six or seven individuals having the upward bend; there can be no doubt, therefore, that it is a peculiarity of structure which will have its use in the economy of the species.

The specimen used for this figure, had not quite attained the complete plumage. The length was about three inches and three lines, that of the bill about nine lines; the latter is black, strong, much bent, and ending in a fine depressed point. The

PLATE 3.

TROCHILUS RECURVIROSTRIS.

(Recurved-billed Humming Bird).

Sharpe sc.

dorsal surface of the upper mandible is straight, and becomes at once curved. The upper part of the body, from the forehead to the tail-coverts, is of a bluish green, with metallic reflections; the throat, forepart, and sides of the neck, extending to the upper part of the breast, are of a brilliant emerald green; a grayish-brown line crosses the middle of the belly, reaching to the crissum, which is white. The flanks and under tail-coverts are golden green, and the plumes covering the thighs are whitish. The tail is composed of feathers of unequal length, the outer ones being gradually shorter than those in the middle. They are golden green in the centre, bluish at the sides, and above present a bronzed reddish tinge. The wings are blackish purple, and reach to the extremity of the tail.

A comparison of the above description by Lesson, and of what follows from Swainson's *Illustrations*, with that of the former plate, will point out the distinctions between *T. avocetta* and *T. recurvirostris*.

Mr Swainson observes as follows:—

"The extraordinary formation in the bill of this beautiful little creature, is without parallel in any land bird yet described, and presents in miniature a striking resemblance to that of the avoset. It is almost impossible to conjecture rightly the use of this singular formation; but it appears to me not improbable, that the principal sustenance of the bird may be drawn from the pendant bignonaceæ, and other similar plants, so common in South America, whose

corollæ are long, and generally bent in their tube; the nectar being at the bottom, could not be reached either by a straight or a curved bill, though very easily by one corresponding to the shape of the flower.

"Bill black, depressed along the whole length, but more especially at the tip, which is rounded, thin, obtuse, and recurved in both mandibles, the under of which, towards the middle, has a convex swelling, which gives the recurvature a stronger appearance. All the upper plumage and body beneath golden green; the throat to the breast shining with scale-like feathers, of a vivid emerald green; from the breast to the vent is a stripe of black down the middle; thighs white; tail even; the two middle feathers dull greenish blue, the rest above obscure coppery brown, but beneath of a rich shining topaz colour."

It was purchased at Bullock's sale, and that gentleman received it from Peru.

PLATE 4.

TROCHILUS RUFIGASTER.

(Rufous bellied Humming Bird.)

Lizars sc.

RUFOUS-BELLIED HUMMING-BIRD.

Trochilus rufigaster.—Vieillot.

Plate IV. Male.

Colibri à ventre roussâtre, *Temminck*, Planches Coloriées, pl. cxx. fig. 2, female.—Le Colibri à ventre roux, *Lesson Histoire Naturelle des Colibris*, pl. ix. male.

According to the work of M. Lesson, perhaps at present the best authority for the distinction of species in this beautiful tribe, this bird is not identical with the *Trochilus Brasiliensis* of Dr Latham; and it has also been confused with some states of the "Brin blanc," *T. superciliosus*, and with the *T. squalidus* of Temminck and Natterer, though we should have thought the difference of size presented by the former, sufficient to distinguish it. We give the description of Lesson, which accompanies the copy used for our plate. The entire length is scarcely three inches, of which the bill will make about eleven lines; that member is lengthened, slender and bending, yellow at the base, and blackish towards the tip; the head, upper part of the neck, and back, are of a bronzed green, which passes into a rich cinnamon colour upon the rump; the wings small and narrow, of a brownish

purple; the throat is whitish; the sides of the neck, breast, belly, and flanks, of a soft shining rufous colour. A narrow line borders the auriculars, and a blackish spot is seen in the middle of the throat; the tail is composed of narrow brown feathers, is wedge-shaped, tipped with reddish. It is a native of Brasil.

PLATE 5

TROCHILUS COLUBRIS.

(Northern Humming-Bird)

NORTHERN HUMMING-BIRD.

Trochilus colubris.—Linnæus.

Plate V.

Red-throated Humming-bird, *Edwards*, *Pennant*, *Latham*.—Trochilus colubris, *Bonaparte*.—The Humming-bird, *Wilson's North American Ornithology*, pl. x. figs. 3 and 4.—The Ruby-throated Humming-bird, *Audubon*, *Ornithological Biography*, pl. xlvii. vol. i. p. 248.—Northern Humming-Bird, *Northern Zoology*, vol. ii. p. 323.—Le petit rubis de la Caroline, Ornismya colubris, *Lesson*, *Histoire Naturelle des Oiseaux-mouches*, pls. lxviii. *bis*, p. 151.

"Where is the person, who, on seeing this lovely little creature moving on humming winglets through the air, suspended as if by magic in it, flitting from one flower to another, with motions as graceful as they are light and airy, pursuing its course over our extensive continent, and yielding new delights wherever it is seen—where is the person, I ask of you, kind reader, who, on observing this glittering fragment of the rainbow, would not pause, admire, and instantly turn his mind with reverence towards the Almighty Creator, the wonders of whose hand we at every step discover, and of whose sublime conceptions we everywhere observe the manifestations in his admirable

system of creation? There breathes not such a person." It is in these words that the enthusiastic Audubon commences the description accompanying his beautiful illustration of these hardy little birds, and with the answer, they are equally applicable to the whole of this numerous family.

For the natural history of the Carolina or Northern Humming-bird, we are principally indebted to the observations of Alexander Wilson, and the ornithologist just now quoted; and their descriptions, taken from reality, being superior to any thing we could supply, the greater part of them will be now used. We remarked in the Introduction, that the humming-birds, with two exceptions, were wanting to the northern continent of America, being apparently unable, from their delicate structure, to bear the severities of a hardier climate, and where the limited supply of the gorgeous plants, and their inhabitants, which form so prominent a feature in the forests of the southern division, would afford a scantier nourishment. Our present species is one of the most hardy, and bears a range of temperature almost from Tropical heat to the rigour of an Arctic latitude, having been lately observed as far north as the plains of the Saskachewan, and the banks of Elk River. It is only during summer that an excursion of such distance is made, and we find their arrival, during migration, occurring at different periods, in various parts of the Canadas and United States. "About the 25th of April," we learn from the *American Ornithology*, "the humming-bird usually arrives

in Pennsylvania; and about the 10th of May, begins to build its nest. In the Savanna in Georgia, it appears from the south about the 23d of March, two weeks earlier than it does sixty miles higher up the country.

"The nest is generally fixed on the upper side of a horizontal branch, not among the twigs, but on the body of the branch itself. Yet I have known instances where it was attached by the side to an old moss-grown trunk; and others where it was fastened on a strong rank stalk, or weed, in the garden; but these cases are rare. In the woods it very often chooses a white oak sapling to build on; and in the orchard or garden, selects a pear-tree for that purpose; the branch is seldom more than ten feet from the ground. The nest is about an inch in diameter, and as much in depth; the outward coat is formed of small pieces of a species of bluish-gray lichen, that vegetates on old trees and fences, thickly glued over with the saliva of the bird, giving firmness and consistency to the whole, as well as keeping out moisture; within this are thick matted layers of the fine wings of certain flying seeds, closely laid together; and lastly, the downy substance from the great mullein, and from stalks of the common fern, lines the whole. The base of the nest is continued round the stem of the branch, to which it closely adheres; and when viewed from below, appears a mere mossy knot, or accidental protuberance. The eggs are two, pure white, and of equal thickness on both sides. On a person approaching their nest

the little proprietors dart around with a humming sound. The precise period of incubation I am unable to give; but the young are in the habit, a short time before they leave the nest, of thrusting their bills into the mouths of their parents, and sucking what they have brought them. As I have found their nests with eggs so late as the 12th July, I do not doubt but that they frequently, and perhaps usually, raise two broods in the same season.

"Their only note is a single chirp, not louder than that of a small cricket or grashopper, generally uttered while hovering from flower to flower, or when engaged in a fight with his fellows; for when two males meet at the same bush or flowers, a battle instantly takes place; and the combatants ascend in the air chirping, darting, and circling around each other, till the eye is no longer able to follow them. The conqueror, however, generally returns to the place to reap the fruits of his victory. I have seen them attack, and for a few moments tease the king-bird; and have also seen him, in his turn, assaulted by a humble bee, which he soon put to flight.

"The singularity of this little bird has induced many persons to attempt to raise them from the nest, and accustom them to the cage. Mr Coffer of Fairfax, county Virginia, raised and kept two for some months in a cage, supplying them with honey dissolved in water, on which they readily fed. As the sweetness of the liquid frequently brought small flies and gnats about the cage, the birds snapped and

swallowed them with eagerness, so that these insects formed no inconsiderable part of their food." And in the summer of 1803, Wilson himself succeeded in raising and keeping some young ones for nearly three months, and might have extended the period, had they not been injured by flying about the room. He thus relates the circumstance:—"In the summer of 1803, a nest of young humming-birds was brought me, that were nearly fit to fly. One of them actually flew out by the window the same evening and falling against a wall, was killed. The other refused food, and the next morning I could but just perceive that it had life. A lady of the house undertook to be its nurse, placed it in her bosom, and as it began to revive, dissolved a little sugar in her mouth, into which she thrust its bill, and it sucked with great avidity, and in this manner it was brought up until fit for the cage. I kept it upwards of three months, supplied it with loaf-sugar dissolved in water, which it preferred to honey and water, gave it fresh flowers every morning sprinkled with the liquid, and surrounded the space in which I kept it with gauze, that it might not injure itself. It appeared gay, active, and full of spirit, hovering from flower to flower, as if in its native wilds, and always expressed, by its motions and chirping, great pleasure at seeing fresh flowers introduced into its cage.

"This little bird is extremely susceptible of cold, and if long deprived of the animating influence of the

sunbeams, droops and soon dies. A very beautiful male was brought me this season (1809,) which I put into a wire cage, and placed in a retired shaded part of the room. After fluttering about for some time, the weather being uncommonly cool, it clung to the wires, and hung in a seemingly torpid state for a whole forenoon. No motion whatever of the lungs could be perceived, on the closest inspection; though at other times this is remarkably observable; the eyes were shut, and when touched by the finger, it gave no signs of life or motion. I carried it out to the open air, and placed it directly in the rays of the sun, in a sheltered situation. In a few seconds, respiration became very apparent; the bird breathed faster and faster, opened its eyes, and began to look about, with as much seeming vivacity as ever. After it had completely recovered, I restored it to liberty; and it flew off to the withered top of a pear-tree, where it sat for some time dressing its disordered plumage, and then shot off like a meteor.

"The flight of the humming-bird from flower to flower, greatly resembles that of a bee; but is so much more rapid, that the latter appears a mere loiterer to him. He poises himself on the wing, while he thrusts his long slender tubular tongue into the flowers in search of food." And Mr Audubon adds, "during their migration they pass in long undulations. I have not, however, been able to assure myself whether they migrate during the day or by night, but am inclined

to think the latter the case, as they seem to be busily feeding at all times of the day, which would not be the case, had they long flights to perform at that period."

This humming-bird has generally been supposed to live only on honey or liquid sweets, but Wilson observes, " I can speak decisively on this subject, having seen the humming-bird for half an hour at a time darting after those little groups of insects that dance in the air in a fine summer's evening, retiring to an adjoining twig to rest, and renewing the attack with a dexterity that sets all our other fly-catchers at defiance. It is well known that they are particularly fond of tubular flowers, where numerous small insects resort, and there is every reason for believing that they are as often in search of these insects as of honey, and that the former compose at least as great a portion of their usual sustenance as the latter."

The Northern Humming-bird is three inches and a half in length, and four and a quarter in extent; the whole back, upper part of the neck, sides, under the wings, tail-coverts, and two middle feathers of the tail, are of a rich golden green; the tail and wings are deep brownish purple; the sides of the belly, and belly itself, dusky white, mixed with green. But what constitutes the chief ornament of this little bird, is the splendour of the feathers of his throat, which, when placed in a proper position, glow with all the brilliancy of the ruby. These feathers are of singular strength and texture, lying close together like scales, and vary, when moved before the eye, from a deep

black to a fiery crimson and a burning orange. The female is destitute of this ornament, which is white, with all the other under parts, and the tip of the tail feathers. The young birds have the under parts brownish white, and are somewhat lighter in the under parts. The males begin to acquire the red feathers on the throat about autumn, but they are not complete before the following season.

The same ornithologist, to whom we have been so much indebted for the history of this bird, has also made it the subject of a poem, which we cannot now omit.

"When morning dawns, and the bless'd sun again
Lifts his red glories from the eastern main,
Then round our woodbines, wet with glittering dews,
The flower-fed humming-bird his round pursues;
Sips with inserted tube the honied blooms,
And chirps his gratitude as round he roams;
While richest roses, though in crimson dress'd,
Shrink from the splendour of his gorgeous breast.
What heavenly tints in mingled radiance fly!
Each rapid movement gives a different die;
Like scales of burnish'd gold they dazzling show,
Now sink to shade—now like a furnace glow!"

PLATE 6

TROCHILUS ANNA

(Duchess of Rivoli's Humming-Bird)

Lizars sc

DUTCHESS OF RIVOLI'S HUMMING-BIRD.

Trochilus Anna.—Lesson.

Plate VI.

Oiseau-mouche Anna, Ornismya Anna, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. lxxiv.

This very beautiful species is said by M. Lesson to be entirely new and unfigured, and he has dedicated it to the Dutchess of Rivoli, (using her Christian name,) whom, with her husband, he has extolled as enthusiastic naturalists. It was discovered in California, by Dr Botta, and introduced in 1829 to the Paris collections, but without any notice of its habits.

This bird is about three inches and five lines in length. The wings, equaling the length of the tail, are of a purplish brown. The tail, very slightly forked, is brown, except the centre feathers, which are green, with metallic lustre. But the most marked feature in the colouring of the plumage is a cowl, of the richest changeable amethystine red, which covers the upper part of the head, and with a more purplish tinge surrounds the eyes, covering the cheeks, and continued

upon the throat and forepart of the neck lengthways on each side. The feathers composing this part, as in the greater number of other species, present the scaly form, and to the touch feel soft like velvet. The upper parts of the neck, back, rump, and lesser wing-coverts, are bright golden green; the forepart of the throat, and lower parts, are greenish, mingled with gray, becoming whitish as they approach the tail.

The young birds have the upper parts of a duller tinge, beneath gray, and the scaly patch is much less brilliant, and loses the scaly texture of the feathers.

PLATE 7

TROCHILUS CYANEUS

(Blue-green Humming-Bird)

Lizars sc.

BLUE-GREEN HUMMING-BIRD..

Trochilus cyaneus.—Vieillot.

Plate VII.

Oiseau-mouche verazur, Ornismya cyanea, *Lesson*, *Histoire Naturelle des Oiseaux-mouches*, pl. lxxi. p. 199.

This species was discovered in Brasil, by MM. Langsdorff and Delalande, and, according to Lesson, was first described by Vieillot, in 1818. It is of small size, being scarcely three inches in length, including the bill and tail. The bill is of a clear yellow, brownish at the tip, slightly dilated at the base; the crown is of a dull green, changing with the light to a pure and brilliant blue; the throat is a mixture of grayish and rich ultramarine blue, according to the position, and in the centre has the plumes of a scaly form and of a brighter hue; the neck, back, and lesser wing-coverts, are of a golden green; the rump and tail-coverts green, with reddish or bronze reflections; the wings, equal in length to the tail, are narrow, and of a purplish black; the tail is slightly forked, and of a uniform steel blue; the breast green, or clear blue, according to the position, changing to brownish

green on the belly; the vent is white, and forms a distinct mark between the green of the belly and brown of the under tail-coverts. The young have the blue of the throat less clear, and the under parts more mingled with gray; the bill is also brown, where it is yellow in the adults.

The female has not been discovered.

PLATE 8

TROCHILUS PRASINA

(Golden-green Humming Bird)

GOLDEN-GREEN HUMMING-BIRD.

Trochilus prasina.—Lesson.

Plate VIII.

L'Orvert, Ornismya prasina, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. lxv.

Lesson considers the species to which he has given the name of *prasina* distinct from *T. viridissimus* of modern authors, but identical with the *T. viridissimus* of Linnæus and Latham. It is a native of Brasil, and certainly yet very little known in collections.

The entire length of this beautiful little bird is about two inches and eight lines, of which the bill makes up seven lines, and the form is in general delicate. The whole plumage, excepting the vent, is of a very deep golden green, but with a clear brilliant and changing lustre, occasionally of a bluish tint; the plumes on the forehead, and breast, presenting the greatest brightness, and assuming the scaly form. The vent is whitish; the wings are brownish purple, of a narrow form, and firm texture; the tail dull indigo blue, broad, and slightly rounded. The plumage of the young birds, and the female of this species seem

yet imperfectly known. Dr Latham, under his *T. virdissimus*, mentions three varieties, one of them having the under parts from the chin to the vent white, the others not materially differing.

PLATE 9

TROCHILUS QUADRICOLOR

(Azure crowned Humming Bird)

AZURE-CROWNED HUMMING-BIRD.

Trochilus quadricolor.—Vieillot.

Plate IX.

Trochilus quadricolor, *Vieillot.*—Oiseau-mouche à tête d'azur, Ornismya cyanocephala, *Lesson, Histoire Naturelle des Oiseaux-mouches. Supplement,* pls. xvii. and xviii.

This very beautiful species has been described by Vieillot by the name we have adopted, as that of its prior describer; and although perhaps not quite so applicable as that given by Lesson, it should be adopted. We are at a loss to understand why that ornithologist has introduced so many changes of nomenclature in his beautiful monograph.

An inspection of the plate will show a difference of form from any of those previously described; and it is probable that this species will form the type, or a very marked individual, in one of the subdivisions. The total length is nearly four inches; the bill is straight, rather enlarged at the base, and of a clear yellow, except the tip, which is black; the tarsi are very short; a patch, or cowl, of brilliant blue, covers the crown extending to the occiput, from the

rictus, in a line beneath the eyes. The upper parts of the body are of a brilliant golden green, and the under parts of a chaste and clear white; the wings are large, equaling the tail in length, and of a purplish brown; and the tail is composed of broad and strong feathers. In the birds of one year, the upper parts assume a grayer tinge; and below, the white is less pure, becoming browner on the flanks and vent. The bill also wants its clearness, and the beautiful azure crown only begins to appear as age advances. The species has yet been only brought from Brasil.

TROCHILUS DELALANDII.

(Delalande's Humming-Bird.)

DELALANDE'S HUMMING-BIRD.

Trochilus Delalandii.—Vieillot.

Plate X.

Trochilus Delalandii, *Vieillot, Dictionnaire d'Histoire Naturelle; Temminck, Planches Coloriees*, pl. xviii. figs. 1, 2. —Le Plumet bleu Ornismya Delalandii, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. xxiii. male; pl. xxiv. female.

This remarkable humming-bird was discovered in Brasil by MM. Delalande and Méñétrier, and has been dedicated by Vieillot to the first of these naturalists. The crown of the male is adorned with a beautiful crest, composed of short feathers, with generally one narrow and elongated, which rises in the centre to an inch in length; it is of a rich and deep blue, tipped with white, and appears very graceful, either when erected, or reclining and folded at rest. Behind the eye, upon the auriculars, there is a small, nearly circular patch of clear white, which forms a conspicuous object. The forepart of the throat, breast, and belly, are rich azure blue, surrounded with gray; the head, back, flanks, and wing coverts, bright and

shining green; the vent and flanks are gray; the wings are brownish purple; the centre feathers of the tail of the colour of the upper parts; the remaining feathers are dull blue, and the outer feathers have a conspicuous spot of clear white at the extremities.

The female is nearly of the same size with the male, but wants the beautiful crest; the upper parts are of a golden green, but less shining, and the under parts, instead of the fine azure, are of a clear gray. The white auriculars and spots on the outer tail feathers are, however nearly as conspicuous as in the other sex.

From this species, and another lately discovered, having the lengthened crest of a lilac colour, Mr Lodiges proposes to form a genus *Cephalepis*. The lilac-crested bird is from the Rio Grande, and has been dedicated to Mr Lodiges.

TROCHILUS MOSCHITUS.

(Ruby-crested Humming-Bird.)

RUBY-CRESTED HUMMING-BIRD.

Trochilus moschitus.—Linnæus.

Plate XI.

Trochilus moschitus, *Linnæus; Gmelin*, 494.—Ruby-crested Humming-bird, *Edwards' Gleanings*, pl. cccxliv.; *Latham, General History of Birds*, vol. iv. p. 330.—Le Rubis Topaz, Ornismya moschita, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pls. lii. liii. liv. p. 166.

This common, but beautiful species, presents perhaps some of the most splendid colouring of any of the family. The upper part of the head and throat are clothed entirely with the scaly-formed feathers, which always compose the parts producing the changeable colours. On the hind head the feathers are elongated, and form a short rounded crest. In one position, this part appears of a deep sombre reddish brown; when viewed transversely, it assumes a bright coppery lustre; and when looked upon directly, with a side stream of light, it becomes of the richest and most brilliant ruby red. The scaly part of the throat and breast again, when wanting the lustre, is of an equally sombre greenish brown; and when held in different lights, changes from a clear golden green to

the most brilliant topaz yellow. It is impossible to convey by words the idea of these tints; and having mentioned those substances to which they approach nearest, imagination must be left to conceive the rest. The other parts of this bird are darkly coloured; the back and rump, breast and belly, are a rich brown, with scarcely any variation of colour, and the vent is pure white. The wings are of the purplish brown, so common in this part to the whole species; and the tail, broad and expansive, is a fine reddish brown, with a narrow band of a dark shade at the tip. The length is about three inches and a half. In some species the colour of the back is so dark around the ruby crest, as almost to appear a black band.

In the birds of one year, the scaly parts on the head and throat are of a brownish gray, a few of the bright feathers here and there appearing, and the other parts of the plumage have generally a lighter tinge. In another specimen which we possess, apparently that of a still younger male, the upper parts are of a grayish brown, with rather conspicuous golden green reflections, the under parts of a clear grayish white, darker on the throat and forepart of the breast, and the quills want the purplish lustre.

The female differs considerably from the male. It is scarcely three inches in length; above, it is of a brilliant golden green; the under parts of a clear grayish brown. But the tail shows the greatest difference in markings; the two centre feathers are a

bronzed green; the base of the others are of the same rufous colour with that of the male; next there is a band of bronzed green, nearly equal in breadth with the reddish colour, and this again is succeeded by a white conspicuous tip to each feather.

The nest is remarkable for warmth and compactness; the sides being formed almost entirely of cottony substances, and only on the outside patched with the leaves of lichens.

In distribution this species seems to have a wide range, is common in most of the West India islands, besides many parts of the southern continent.

VIOLET-CROWNED HUMMING-BIRD.

Trochilus sephanoides.—Lesson and Garnot.

Plate XII.

Orthorhynchus sephanoides, *Lesson et Garnot, Zoologie de la Coquile*, pl. xxxi. fig. 2.—L'Oiseau-mouche a Couronne Violette, Ornismya sephanoides, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. xiv. p. 69.

Lesson, in his synopsis of this family, has introduced as a synonyme to the violet-crowned humming-birds, *Melisuga Kingii* of Vigors, described by that gentleman in the *Zoological Journal;* but in the monograph of the former naturalist no mention is made of the strongly acuminated tail feathers, which are mentioned as so distinguishing a mark by both Captain King and Mr Vigors; we have therefore for the present omitted it, until we have better grounds for the conjunction. We presume Lesson has not compared his specimens with those brought home by Captain King.

The discovery of the species, we believe, is due to MM. Lesson and Garnot, who met with it during the voyage of the Coquile, and have described and figured

TROCHILUS SEPHANOIDES.

(Violet crowned Humming-Bird.)

Lizars sc.

it in the splendid volume devoted to the natural history of that expedition.

It inhabits Chili, and was met with in the woods surrounding the Bay of Conception, near Talcaguano. They were generally found at mid-day, enjoying the flowers of a scarlet loranthus, which abounded in a honied juice. It was in that district a bird of passage, retiring north during winter.

This species is about four inches in length, and in form is stronger than many of its congeners, and the shafts of the quills are of more than ordinary strength. The crown is adorned with violet plumes, forming a sort of cowl, lengthened towards the occiput. The upper parts of the body are of a golden green, which also tinges the wings and tail. The throat is white, the plumage composed of scaly feathers, each marked in the centre with an oval brownish spot; the breast and belly are reddish white; the tail and wings brown, with violet reflections.

VIOLET-TUFTED HUMMING-BIRD.

Trochilus petasophorus.—Neuwied.

Plate XIII.

Trochilus petasophorus, *Neuwied;* and *Temminck, Planches Coloriées*, cciii. fig. 3.—Oiseaux-mouches pétasophore, Ornismya petasophora, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. i. male.

The birds figured on this and the following plates, present a curious feature in the tufts of feathers which arise from the sides of the neck, but in other respects show a close alliance in form to some other straight-billed birds, such as the *T. squamosus* and *albicollis* of Temminck; and that now described has the additional feature of having the bill serrated upon the margins.

It is a native of Brasil, and was met with by both Natterer and the Prince Maximilian of Neuwied. The upper parts are of a golden green, and a soft and brilliant tint of the same colour clothes the chin and throat, changing to a duller shade upon the breast, on the belly and vent having a slight tinge of gray, while the under tail-coverts are of a pure white.

TROCHILUS PETASPHORUS.

(Violet-tufted Humming-Bird)

Lizars &c.

The characteristic appearance, however, is the tufts of rather stiff feathers which spring from under the auriculars, and expand themselves upon the sides of the neck. They are of a purplish or violet tint, but in many lights assume that of a golden green.

Specimens have yet been only received from Brasil, and the female has not been discovered.

NATTERER'S HUMMING-BIRD.

Trochilus scutatus.—Natterer.

Plate XIV.

Oiseau-mouche écussonné, Trochilus scutatus, *Natterer; Temminck, Planches Coloriées*, ccxcix. fig. 3.—Le Natterer, Ornismya Nattererii, *Lesson, Histoire Naturelle des Oiseaux mouches*, pl. xvi. p. 75.

The first specimens of this remarkable humming-bird were sent to Europe from the interior of Brasil by M. Natterer and M. Auguste de St Hilaire.

The most remarkable feature in the plumage of this bird, is two thick, and almost downy tufts, of very deep indigo blue, which spring from under the eyes, and form a sort of ruff upon the sides of the neck, and which Lesson thinks appear only during the breeding season, as in the ruff, (*Tringa pugnax*, Linn.) If this is the case, do the ear tufts, and feathery appendages incident to so many of the family, appear only at this season, and disappear again when a quieter time succeeds? Each tuft is tipped with yellow, which relieves them, when hanging upon the same deep indigo which covers the upper part of the

PLATE 14.

TROCHILUS SCUTATUS

(Natterer's Humming-Bird.)

Lizars sc.

breast and belly. The forehead is clothed with bright green and scaly feathers, and is separated from the golden but duller green of the hind head and upper parts by a bandelet of deep velvety black, which runs over the head in a line with and from eye to eye. The throat and front of the neck is shining green, and the feathers, lengthened and narrow, form a beautiful gorget displayed upon the dark indigo of the breast. The vent and under tail-coverts are dirty white. The tail is equal at the end, and, like those of this form, has the feathers broad and expanded; it is of a metallic green colour—of an equal brilliancy above and beneath.

Lesson has changed Natterer's name to that of the discoverer himself; but, independent of priority, when not entirely inappropriate it cannot be a compliment to change the name given by the discoverer, even when substituted by his own; we have therefore retained it.

THE TUFTED-NECKED HUMMING-BIRD.

Trochilus ornatus.—Linnæus?

Plate XV. Adult Male.

Le Huppé-col, *Buffon, Planches Enluminées*, 640.—Tufted-necked Humming-bird, *Latham's General History of Birds*, vol. iv. p. 348.—Le Huppé-col, Ornismya ornata, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. xli.

Among the curious forms assumed by the plumage of the humming-birds, we have already seen various feathered excrescences, as it were, issuing from different parts of the body, and in none are they so singular as in the tribe which our present species and one or two following represent. They are called by the French, Coquets; and Lesson has formed from them a genus, *Lophornis*, including this with the three following and some other species. In this bird, in addition to an ample crest of clear reddish chestnut upon the head, the sides of the neck are adorned with tufts of narrow feathers, almost an inch in length. They are composed of from ten to twenty plumes, of the same colour with the crest, and are terminated with

TROCHILUS ORNATUS, Male.

(The Tufted necked Humming-Bird.)

Edwards del

a broadened tip of clear shining green.* The throat, and upper part of the breast, with the forehead, bordering the rufous crest, is covered with bright emerald-green scaly feathers, which are separated from the upper parts by a line of a paler shade running through the eyes to the rictus, and from the lower part of the breast and belly, by a band of rufous of the same tint with the crest. The upper parts are of a bronzed green, with steel-blue reflections; and this is again separated from the tail by a conspicuous band of grayish white. The tail is broad and ample; the centre feathers greenish—the others deep chestnut red, with purplish reflections.

Cayenne, Guiana, and Brasil, are the countries where this species is most abundant; and the Prince Maximilian mentions having found them on dry and arid plains, clothed with a scanty and bushy vegetation.

* The number of feathers in these tufts is said to be generally from twelve to fourteen, but Dr Latham mentions having counted eighteen in one specimen and twenty in another.

THE TUFTED-NECKED HUMMING-BIRD.

Trochilus ornatus.—LINNÆUS.

PLATE XVI. FEMALE.

THE female is in general rather less in size, and wants the crest and neck tufts, but the other parts of the plumage hardly fail in brilliancy to those of the male, represented on our last plate. The under parts are of a redder tinge, where the white predominates in the male, and the band on the rump is not so clearly defined.

TROCHILUS ORNATUS, Female.

(The Tufted-necked Humming Bird.)

TROCHILUS AUDENETH.

(Audenet's Humming-Bird.)

Isaac Ja

AUDENET'S HUMMING-BIRD.

Trochilus Audenetii.—Lesson.

Plate XVII.

L'Oiseau-mouche Audenet, Ornismya Audenetii, *Lesson, Histoire Naturelle des Oiseaux-mouches, Supplement*, pl. ii. p. 102.

This fine species was first described and figured in Lesson's Monograph, and will range in the division with *T. ornatus* and *magnificus*, having like them a slender form, a broadly expanded tail, and a neck adornment of narrow lengthened plumulets. M. Lesson observes, "Of this rare and valuable species, we know only a single specimen, which was communicated to us by M. Verreau, and now forms part of the collection of M. Audenet in Paris, and, without doubt, is one of the most remarkable for its elegance, its rich clothing, its light and airy form, and the delicate plumes which adorn its neck."

It is scarcely three inches long; the wings small, narrow, and falciform, scarcely reaching beyond the middle of the tail. The feathers on the crown are thick, loose, and slightly elongated, and with the back

and wing-coverts are bright emerald green. A band of black, bordered on each side with white, crosses the rump, and the tail is of a clear blackish blue. The throat and forepart of the neck are clothed with small scaly feathers, having a rich green lustre, from each side of which springs a thick tuft of narrow rounded feathers, of a bright emerald green, and marked on the tip of each with a round white spot. The feathers on the lower parts of the body are of a rounded and scaly form, brownish black at the base, and yellowish at the tips, giving a waved appearance to the whole.

The specimen of *T. Audenetii*, as far as could be traced by its describers, was brought from Peru.

PLATE 18.

TROCHILUS CHALYBEUS.

(Vieillot's Hummang-Bird)

VIEILLOT'S HUMMING-BIRD.

Trochilus chalybeus.—Vieillot.

Plate XVIII.

Trochilus chalybeus, *Vieillot; Temminck, Planches Coloriees*, lx. fig. 2.—Oiseau-mouche Vieillot, Ornismya Vieillotii, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. lxiv. p. 186.

This elegant humming-bird was first described by M. Vieillot in 1823; Temminck gave a very good representation of it in his *Pl. Coloriees*, and it has recently been figured in the splendid publication of M. Lesson, who has dedicated it to Vieillot, an eminent and laborious ornithologist. We have preferred retaining the name given by its discoverer.

It is about three inches in length, and of a light and graceful form; the sides of the neck are adorned with two bundles of green lengthened fan-shaped feathers, having a round white spot at the extremity of each. The forehead and cheeks are brilliant green, and a line of black runs from the bill to the occiput; the back and upper parts of the body are green, with yellowish reflections; the sides and forepart of the

neck are tinged with blue, and longitudinally spotted with grayish black; the other lower parts are gray, waved and mottled with black, and a white band crosses the lower part of the belly, and is seen upon the rump. The quills are of a purplish brown, and the tail, nearly equal at the extremity, is of a rich sienna red.

The female, and birds of young plumage, have been figured in Lesson's *Continuation;* the former is there described for the first time. It entirely wants the ear tufts, and is of a plain and unobtrusive dress. The upper parts, from the rictus in a line below the eyes, of a uniform golden green, interrupted by the reddish tail-coverts and their white crossing band; the under parts gray; greenish on the flanks.

Vieillot's Humming-bird is a native of Brasil, and is very rare in collections.

* See vignette to vol. ii. for a figure of a male in very perfect adult plumage.

TROCHILUS MAGNIFICUS. Young Male.

(Magnificent Humming Bird.)

MAGNIFICENT HUMMING-BIRD

Trochilus magnificus.—Vieillot.

Plate XIX. Young Male.

Trochilus magnificus, Oiseau-mouche magnifique, *Vieillot*, *Dictionnaire des Sciences Naturelles* (1817 and 1818); *Temminck's Planches Coloriées*, cxxcix. fig. 2.—Le Hausse-col blanc, Ornismya strumaria, *Lesson*, *Histoire Naturelle des Oiseaux-mouches*, pl. xlii. and xliii. p. 143.

We have given plates of the young male and female of this species, as being less known than the bird in the adult state, and though presenting plumage of less splendour, it is perhaps more chaste and pleasing. It also ranges with the form represented by *T. ornatus* and its allies, and the adult male has the neck adorned with beautiful plumulets of snowy white, relieved by a black or very dark olive-green band on the tip of each. These tufts are also so far different, that the feathers are much shorter and broader, and scarcely present so stiff an appearance as those of its congeners, while the ruff extends nearly round like a gorget in front. In the young males neither the crest nor ruff appears; the crown of the head is of a dull yellowish

red, changing into a darker and grayer shade towards the hind head, which runs in a line from the eye to the shoulders; the upper parts are of a rich green, and are separated by the above-mentioned line from the lower region of the body, which is of a grayish white, tinged with rufous on the throat and breast, and entirely devoid of the brilliant scaly plumes occupying the throat of the adult.

It is a native of Brasil.

TROCHILUS MAGNIFICUS. Female.

(Magnificent Humming-Bird.)

Lizars sc.

MAGNIFICENT HUMMING-BIRD.

Trochilus magnificus.—Vieillot.

Plate XX. Female.

The plumage of the female is as unobtrusive as that of the young male, figured on the preceding plate, and it is only the adults that have any pretensions to the name which Vieillot applied to them. The female nearly equals the male in size, is destitute entirely of the ruff, and does not even show the dark line upon the sides of the neck, which indicates its place in the young of the opposite sex. The forehead and throat are yellowish chestnut, and the breast and lower parts are gray, delicately mottled with a darker shade; hind head and back are greenish gray, which changes into a shade of clearer green upon the sides and shoulders; the wings are purplish brown, and the tail is rufous, with the middle feathers, and a cross central band, olive green.

DOUBLE-CRESTED HUMMING-BIRD.

Trochilus cornutus.—Neuwied.

Plate XXI. Male.

Trochilus cornutus, *Neuwied Voyage au Brésil.*—Trochilus bilophus, *Temminck, Planches Coloriès*, xviii. fig. 3.—Oiseau-mouche aux Huppes d'or, Ornismya chrysolopha, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. vii. p. 55.

The discovery of this most splendid species is due to the Prince Maximilian de Wied-Neuwied, who described it, in his "Voyage to Brasil," under the name of *T. cornutus*, and furnished the specimens from which M. Temminck made the drawings for his *Pl. Coloriès*. It inhabits the exalted Campos-Geraes of Brasil, near the sources of the river Don Francisco.

This humming-bird is about four inches in length, of which the tail alone measures nearly the half; the bill and feet are remarkably slender, the former slightly bent, terminating in a very fine point. The most characteristic mark of this species is the two flattened crests, composed of six feathers, which divide in front of the head, on a level with the eyes, and are directed forwards. Lesson, describing them, says, "Ces deux

TROCHILUS CORNUTUS, Male.

(Double-crested Hummung-Bird.)

Lizars sc

huppes pouissent de l'éclat le plus extraordinaire; elles étincellent avec le brillant de l'or et celui de cuivre rouge: le reflets du rubis et ceux de l'émeraudes, le rouge de feu, le vert le plus pur, le jaune le plus éclatant, chatoient de manière à èblouir les yeux, et surpasser la description qu'on chercherait à faire de ces teintes si fugitives et si belles."

The colours of these tufts, or horns, certainly baffle description, and an idea can only be conveyed by likening them to some familiar object, such as the bright and changing hues of steel, and other metals, or the sparkling tints of precious stones. The centre of the forehead between the tuft is covered with scaly feathers, of a brilliant green and blue reflections. A gorget of deep and rich purple composed of lengthened feathers, reaches from behind the eyes upon the breast; the breast and upper part of the belly is of the purest white; the same colour crosses the lower sides of the neck, nearly meeting on the back, and forms a beautiful contrast to the deep-coloured and delicately formed feathers of the gorget. The belly and vent are of the same green with the upper parts; the wings are brown; the tail is strongly wedge-shaped; the two centre feathers brown; the others pure white.

DOUBLE-CRESTED HUMMING-BIRD.

Trochilus cornutus.—Neuwied.

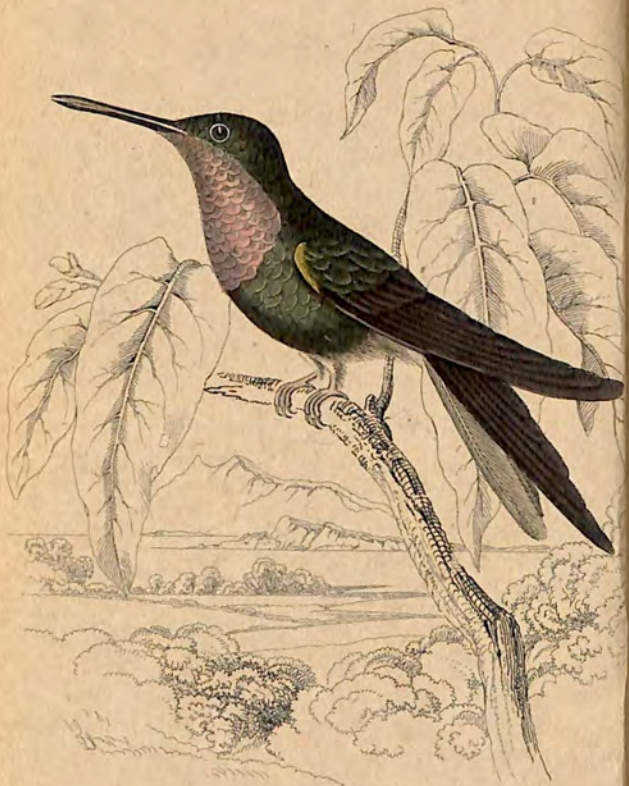
Plate XXII. Female.

L'Oiseau-mouche aux Huppes d'or, Ornismya chrysolopha, *Lesson Histoire Naturelle des Oiseaux-mouches*, pl. viii. p. 55.

The female wants the splendid crests which adorn the head of the male, but the other parts of her plumage will scarcely yield in brilliancy. The crown is rich ultramarine blue, and the dark gorget is distinctly marked; the tail is of equal length, and with the nuchal collar and under parts are pure white; the hind head, back, and shoulders, are bright golden green; the wings are purplish black.

TROCHILUS CORNUTUS. Female.

(Double-crested Humming Bird.)



TROCHILUS FURCATUS.

(Violet Forked-tailed Humming-Bird.)

VIOLET FORKED-TAILED HUMMING-BIRD.

Trochilus furcatus.—GMELIN.

PLATE XXIII.

Trochilus furcatus, *Gmelin*, xxvi.—L'Oiseau-mouche à queue fourchue, *Buffon*, *Planches Enluminées*, 672, fig. 1.?—Lesser forked-tailed Humming-Bird, *Latham's General History*, *Variety B.*—Oiseau-mouche violet à queue fourchue, Ornismya furcata, *Lesson*, *Histoire Naturelle des Oiseaux-mouches*, pl. xviii. p. 82.

THIS species, one of the oldest known, is common in many parts of South America, and possesses a considerable geographical range, being found in Brasil and Guiana, the island of Jamaica, and Cayenne. Notwithstanding, the male only is known, and even the plumage of the young is not accurately ascertained.

The bill, of considerable strength, is very slightly bent, and of a deep black. The general state of this bird is nearly that as figured by Buffon, golden green above, with the wings and tail inclining to a violet purple, a patch upon the throat of beautiful amethystine purple, and the under parts pure white, tinged

with greenish on the flanks. Dr Latham describes three states, and our present figure agrees with his variety B, described from a specimen in the British Museum.

TROCHILUS VESPER.

(The Fiery-throated Humming Bird.)

THE EVENING HUMMING-BIRD.

Trochilus vesper.—Lesson.

Plate XXIV. Male.

L'Oiseau-mouche vesper, Ornismya vesper, *Lesson Histoire Naturelle des Oiseaux-mouches*, pl. xix. p. 85; female, *Lesson's Continuation*, pl. vi.

The present species has been figured by M. Lesson, from specimens in the collection of the Jardin du Roi, as different from the *T. cyanopogon*, to which it is nearly allied, but differs much in size. The upper parts are of a grayish green, of a more golden tinge on the back and rump, but generally wanting the lustre so prevalent in this race. The gorget is reddish violet, with all its changes, and is surrounded on its lower edge with a collar of grayish white. The breast and belly are white, changing into gray on the flanks and vent. The under tail-coverts are pure white.

The female has been also figured and described for the first time in the continuation of M. Lesson's Monograph, which that ornithologist has again resumed; the under parts are entirely white, and there is no trace of the brilliant gorget belonging to the male.

The Evening Humming-bird inhabits the neighbourhood of Valparaiso, upon the naked and little-wooded plains; and the above quoted ornithologist remarks, that the birds inhabiting these elevated, almost mountainous plains, want the splendid lustre to the upper plumage. Thus, *T. cora* is found in Peru, *T. cyanopogon* in Mexico, and *T. vesper* in Chili, all tinted as we have described.

PLATE 25.

TROCHILUS CORA.

(The Cora Humming-Bird.)

Lizars sc

THE CORA HUMMING-BIRD.

Trochilus Cora.—Lesson and Garnot.

Plate XXV.

Orthorhynchus Cora, *Lesson, Zoologie de la Coquille*, p. 31, fig. 4.—L'Oiseau-mouche Cora, Ornismya Cora, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. vi. p. 52.

The Cora Humming-bird was discovered in March 1823, by MM. Lesson and Garnot, the naturalists who accompanied the Coquille in her exploratory voyage round the world, and a description and plate was first published in the zoological volume illustrating the novelties which occurred during it.

The Cora inhabits the sloping banks of the elevated country lying between Callao and Lima, where the surface is low and marshy, and large portions are covered with salt, crystallized by the heat, on which there is little vegetation, and where the foliage is of a hue dull and glaucous. This splendid species is seen constantly on the wing, and seldom alights upon any of the blossoms.

The whole length of this little bird is about five inches five lines, of which the tail makes three inches

and two lines. The upper part of the head, back, rump, and wing-coverts, are of a uniform brilliant green; the feathers of the throat, neck, and cheeks, are of a bluish or steelly lustre, and have the form of scales; the remaining lower parts of the body are of a dingy white, brownish on the flanks. The tail feathers are white at the base of the inner webs, brownish on the outer and towards the tips. The feet are reddish.

Lesson has again employed one of his favourite mythological names to denote this species. He says, the specific name will recall one of the gods whom the ancient Mexicans and Haytians adored.

TROCHILUS DUPONTII.

(Dupont's Humming-Bird)

Edwards sc.

DUPONT'S HUMMING-BIRD.

Trochilus Dupontii.—Lesson.

Plate XXVI.

L'Oiseau-mouche Zemes, Ornismya Dupontii, *Lesson, Supplément des Oiseaux-mouches*, pl. i. p. 100.

Our plate is engraved from the representation of Lesson, which is made from the only known specimen, in possession of M. Dupont, to whom the species has been dedicated.

It is a native of Mexico, has a sharp and pointed bill, a lengthened tail, and a form comparatively slender. The total length is about four inches and a quarter, inclusive of the bill and tail. The upper part of the plumage is of a shining yellowish green, crossed upon the lower part of the back by a white band; a patch of black, or dark blue, according to the light in which it is viewed, covers the throat, cheeks, and middle of the neck. The flanks and belly are a light brownish green, passing into pure white on the vent. The wings are rather short, narrow, and falciform, of a brownish purple. The tail is remarkable for the form of the exterior feathers,

which are longest, and are expanded, or, as it were, flattened towards the tips; the inner feathers gradually decrease in length, are entirely broad, reddish at the base, changing to a fawn colour, and tipped with pure white.

TROCHILUS ENICURUS.

HALF-TAILED HUMMING-BIRD.

Trochilus enicurus.—Vieillot.

Plate XXVII.

Trochilus enicurus, *Vieillot, Nouvelle Dictionnaire d'Histoire Naturelle.*—Oiseau-mouche à queue singulière, *Temminck, Planches Coloriees*, pl. lxvi. fig. 3, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. xv. p. 72.—Ornismya heteropygia, *Lesson's Synopsis.*

This humming-bird, remarkable in having only six quills in the tail, was first figured by Temminck, who remarks, "we cannot doubt the existence of this singular bird, as, besides that which I have myself seen, M. Vieillot has assured me that he has seen many others, (*plusieurs autres.*) Bullock's museum possessed a specimen, Delalande another, in no way differing from the specimen in the Baron Laguier's Collection." The last-mentioned specimen has served as a copy for both Temminck and Lesson, which we have also used. There appears in all the specimens to be no falling out or want of the feathers, and it is a real anomaly among its numerous family.

Nevertheless, and without any disparagement to the accuracy of these high authorities, we feel great curiosity to examine specimens of this bird. If the construction of the tail proves as has been mentioned, it will not only prove a singular tail among its own large family, but will be the only known bird which has only six tail feathers.

This little species is of a slender make; above, of a golden green, and the belly and vent are of the same colours. The throat and upper part of the breast is covered with a scaly patch of rich purple, and succeeding this, bands of white and yellow fill up the space between the gorget and green of the belly, stretching over upon the back in a crescent form. The tail, as we have mentioned, consists of six feathers of a purplish brown, the outer pair very short, the others lengthened, forming a fork of nearly two inches, almost two-thirds of the length of the body, which widens, or curves outward at the extremity.

Vieillot says that it inhabits Brasil, M. Temminck the island of Trinite.

TROCHILUS SAPHIRINUS.

(Sapphire throated Humming Bird.)

SAPPHIRE-THROATED HUMMING-BIRD.

Trochilus sapphirinus.—LINNÆUS.

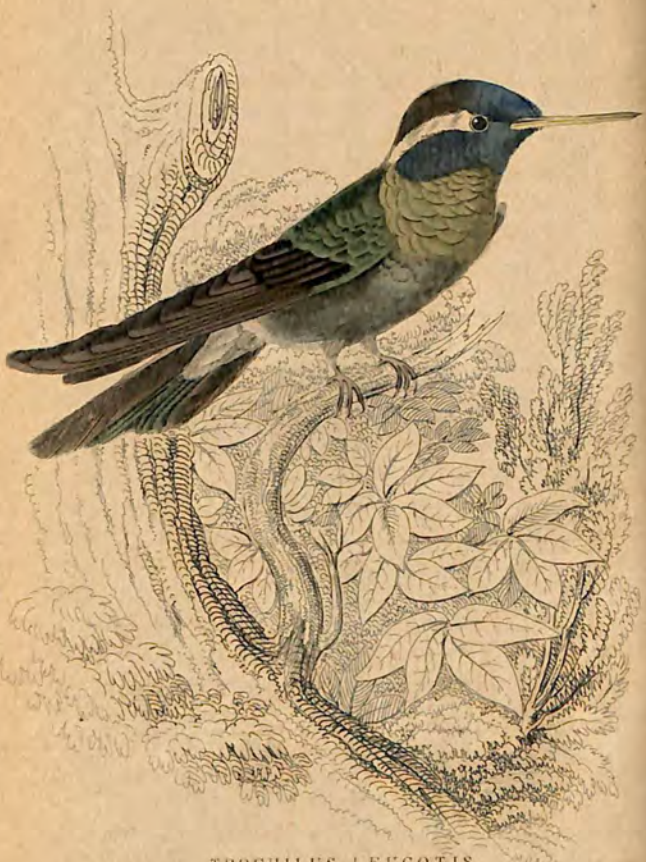
PLATE XXVIII.

Sapphire Humming-bird, *Latham's General History*, vol. iv. p. 326.—Oiseau-mouche Saphir, Ornismya sapphirina, *Lesson, Histoire Naturelle des Oiseaux-mouches*, lv. lvi. and lvii. p. 172.

THE Sapphire-throated Humming-bird, or, as it is sometimes called, "the Sapphire," is about three inches and six lines in length. The bill is a clear yellow, blackish towards the point; the crown and upper part of the body are bright golden green; the chin is of a clear reddish brown or rust colour, from which, covering the throat, breast, and upper part of the belly, extends the rich and beautiful blue that has furnished the name to the bird; it is composed of the scaly-shaped feathers, and, in some lights, has a violet lustre; the flanks and belly are brownish green, changing to gray on the vent; the tail is equal, and entirely of a clear red. The female wants the rusty-coloured chin, and is of a duller colour above. The young is described by Vieillot, as of a blackish gray underneath; the red on the chin slightly apparent;

the bill of a brownish colour. They inhabit Guiana, Cayenne, and Brasil, and, according to Dr Latham, they are not very rare in the island of Berbice.

PLATE 29.



TROCHILUS LEUCOTIS.

(White-eared Humming-Bird.)

WHITE-EARED HUMMING-BIRD.

Trochilus leucotis.—VIEILLOT.

PLATE XXIX.

Trochilus leucotis, *Vieillot Nouvelle Dictionnaire l'Histoire Naturelle.* — Oiseau-mouche Arsenne, Ornismya Arsennii, *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. ix. p. 60.

VIEILLOT has described this species, in the *New Dictionary of Natural History*, under the title of "Oiseau-mouche à oreilles blanches," (*Trochilus leucotis*;) while Lesson has figured, and dedicated it, in his *Synopsis*, to M. Arsenne, a rising French artist. The latter name we have rejected, for obvious reasons.

The head is of a brownish violet colour, which is insensibly shaded into the golden green which covers the whole upper parts, and even the quills. A tinge of azure blue shines upon the forehead, and is still more brilliant on the cheeks and throat, and a gorget of the clearest verdigris green covers the breast. A spot of pure white arises behind each eye, and forms a line of that colour above the auricular feathers; whence its name. The belly and flanks are grayish green; the vent and under tail-coverts pure white;

the tail is nearly equal; the feathers rounded, and rather broader at the tips; brown, except those in the centre, which are of a similar shade with the upper parts. The total length is about three inches.

It inhabits Brasil, and appears very rare. M. Lesson remarks, that the only collection in Paris where there is a specimen, is that of the Duc de Rivoli, where his drawing was taken, and from which our plate is a copy.

PLATE 19.

TROCHILUS MAGNIFICUS. Young Male.

(Magnificent Humming Bird.)

Lizars sc

WHITE-COLLARED HUMMING-BIRD.

Trochilus mellivorus.—LINNÆUS.

PLATE XXX.

Trochilus mellivorus, *Linnæus, Systema Naturæ.*—White-bellied Humming-bird, *Edwards's Birds*, pl. xxxv.; *Latham's General History of Birds*, vol. iv. p. 324.—La Jacobine, *Buffon, Planches Enluminées*, DCXL.;—*Lesson Histoire Naturelle des Oiseaux-mouches*, pls. xxi. and xxii. p. 90.

THIS distinctly marked species may be met with in almost every collection, and is one of the oldest known. The changes from the young to the adult plumage are considerable, which has occasioned its description under more than one name. The plumage of the adult male is a very deep and fine blue on the crown, cheeks, throat, and upper part of the breast; the back, rump, upper tail-coverts, and shoulders, golden green, marked on the back of the neck with a crescent-shaped spot of the purest white; the belly and vent pure white; the tail, of very broad feathers, white, each tipped with black, and narrowly lined with the same colour on the outer margins.

Lesson has figured the female as golden green above, including the centre tail feathers, and basal half of the

others; the remaining part of the tail, which is of the same form as in the male, is narrowly tipped with white, succeeded by a band of rich blue, the outer web of the outer feathers being the only other white portion. The under parts are gray; the feathers on the throat assuming the scaly texture, and marked in the centre of each with a darker colour. The same naturalist mentions a specimen in the Paris Museum, with the centre tail feathers black; and a specimen, in our own possession, has the tips of the tail feathers black for nearly half an inch. These may perhaps agree with Latham's spotted-necked humming-bird, *Trochilus fimbriatus*. We are almost inclined to think, that the white of the tail becomes perfect as they advance in age, like the same colour in many other birds.

It has been found in Cayenne and Surinam, and several of the West Indian Islands. The specimens which served for the accompanying plate, are from Tobago, where it is said to be found chiefly in low marshy situations, among the plantain bushes, in company with the sabre-wing, feeding constantly on the wing.

TROCHILUS MULTICOLOR.

(Harlequin Humming-Bird.)

Lizars sc.

HARLEQUIN HUMMING-BIRD.

Trochilus multicolor.—Latham.

Plate XXXI.

Harlequin Humming-bird, Trochilus multicolor, *Latham's General History of Birds*, vol. iv. p. 316.—L'Arlequin, *Vieillot, Oiseaux Dorés*, pl. lxix.—*Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. lxxii. p. 201.

This curious and singularly marked species was figured and described by Dr Latham, from a specimen in the British Museum, and a representation of it also existed among the drawings of General Davis, and rests on these authorities. It was copied from Latham into the *Oiseaux Dorés* of Vieillot, again by Lesson in his Monograph, and we have ventured a third time to introduce it, with the view of attracting the attention of British naturalists, for it has been hinted that the specimen in the British Museum was a specimen made up from the feathers of different birds. Dr Latham, after the publication of his figure, was aware of this; and in a notice to his second edition, expressly says, "by every attention paid to it, I cannot detect it." If there is a specimen in the British Museum, and a

drawing in the possession of General Davis, corresponding and evidently done from an individual of the same species, there will be no doubt of its existence. We give Dr Latham's description in his own words. "Length, four inches and a half; bill bent, one inch and a quarter in length, and brown; crown of the head, chin, breast, and middle of the back, green; from the bill through the eyes, a fine blue stripe, passing almost to the nape; the lower part of this edged with black; upper parts of the body and wings, brown; belly and vent, the colour of cinnebar, but not glossy, like the rest of the plumage; tail even at the end, and brown; legs, pale brown."

TROCHILUS GRAMINEUS.—Adult Male.

BLACK-BREASTED HUMMING-BIRD.

Trochilus gramineus.—Linnæus.

Plate XXXII. Adult Male.

Colibri du Mexique, *Buffon, Planches Enluminées*, dclxxx.—Black-breasted Humming-bird, *Latham's General History*, vol. iv. p. 302.—Le Haïtien, *Lesson, Histoire Naturelle des Colibris*, pl. xii. male.

"The Haitien," says M. Vieillot, "delights in the vicinity of inhabited places, which it rarely quits as long as the trees and shrubs continue in bloom; it generally perches on a stray or withered twig, where it expands its tail. I have never heard it sing, but while flying, and especially during the season of incubation, it utters a continued cry, which often betrays it before it would otherwise be discovered. This little bird will seldom allow others to approach the tree on which its nest is built. The mocking-bird is obliged to yield to his pursuit; he continually darts around, and striking his bill at the eyes of the intruder, obliges him to fly." This species is of a strong make, and above the average size of the humming-birds. It will range in the division which includes the well-known *T. mango*, for which in some states it has been mistaken.

The young have also been described under different names; but a comparison of the present plate with that following, engraved from Lesson's Monograph, will point out the distinction. It has been sent to Europe from Guiana and St Domingo, but will most probably have a wider range.

The upper parts of the adult male are of a golden green; on the throat there is a patch or gorget of deep and bright emerald green scaly feathers, and which with some lights appear almost black; this is succeeded with a large patch of dull black occupying the forepart of the breast, whence the name given by Latham; the belly and flanks are brownish, tinged with green, and the vent is white; the wings are powerful; the shaft of the first quill very strong; the tail is ample, rounded at the extremity, which is bordered with black for a quarter of its length, while the basal half is of a clear purplish brown.

TROCHILUS GRAMINEUS—Young.

(Black-breasted Humming Bird.)

BLACK-BREASTED HUMMING-BIRD.

Trochilus gramineus.—Linnæus.

Plate XXXIII. Young.

The Synonyms to this state will perhaps be Trochilus gularis, *Linnæus.*—Black-breasted Humming-bird, *Latham*, variety B.—Green-throated Humming-bird, *Latham's General History*, vol. iv. p. 305.—Le Haïtien, jeune age, *Lesson, Histoire Naturelle des Colibris*, pl. xii. vir. p. 56.

The upper parts in this state are of a golden green, changing to brownish on the forehead; on the forepart of the neck there is a black streak, through which appear some green scaly feathers; the black is surrounded on the sides with white, clouded with grayish and reddish spots; the flanks and sides of the breast are green, tinged with brown; the middle tail feathers are a very deep greenish brown; the other feathers are nearly as in the adult state, but are terminated with a white spot.

BLUE-THROATED SABRE-WING.*

Trochilus latipennis.

PLATE XXXIV.

Trochilus latipennis, Broad-shafted Humming-bird, *Swainson, Zoological Illustrations*, first series, plate cvii.—Oiseau-mouche latipenne, (Campylopterus latipennis, *Sw.*) *Lesson, Histoire Naturelle des Oiseaux-mouches*, pl. xxxv. p. 124.

WE are indebted to Mr Swainson for permission to copy his beautiful plate of this singular bird; and since the figure was completed, we have fortunately, by the attention of Mr Kirk, received two perfect specimens of the bird itself from the island of Tobago, which have served for the following description. We may remark, that Mr Swainson's specimen was purchased at Bullock's sale, and that he considered the specimen unique; and when Lesson published his Monograph, in 1829, no specimen existed in the Paris collections.

The Tobago specimens are about five inches and a quarter in length. On the throat is a patch of the clearest violet-blue, shading off to steel-blue on the

* This plate is slightly reduced from the original.

PLATE 34.

CAMPYLOPTERUS LATIPENNIS

(Blue-throated Sabre wing)

sides, and which forms a gorget, passing in a line with the rictus. The upper and under parts, and shoulders, are of a rich golden green, of a yellower tinge on the belly and vent. The wings are purplish black, and are remarkable for the strength and breadth of the quills, particularly the three first, which nearly equal the plume in breadth. The feathers of the tail are very broad and ample. They are ten in number; the centre ones are black, with a bright green lustre. The next pair also black, with a steel-blue lustre, or, as Mr Swainson expresses it, raven black; the remaining three on each side are pure white.

The accompanying notes from Tobago mention, "that they take their abodes principally in the woods, by rivulets, or in low marshy places, among the wild plantain bushes. When some particular trees are in blossom, they are to be seen in great numbers, in the cool of the evening, playing and feeding around them."

This species will serve to point out the form which Mr Swainson proposes to designate by the title of *Campylopterus*.

END OF VOLUME FIRST.

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